

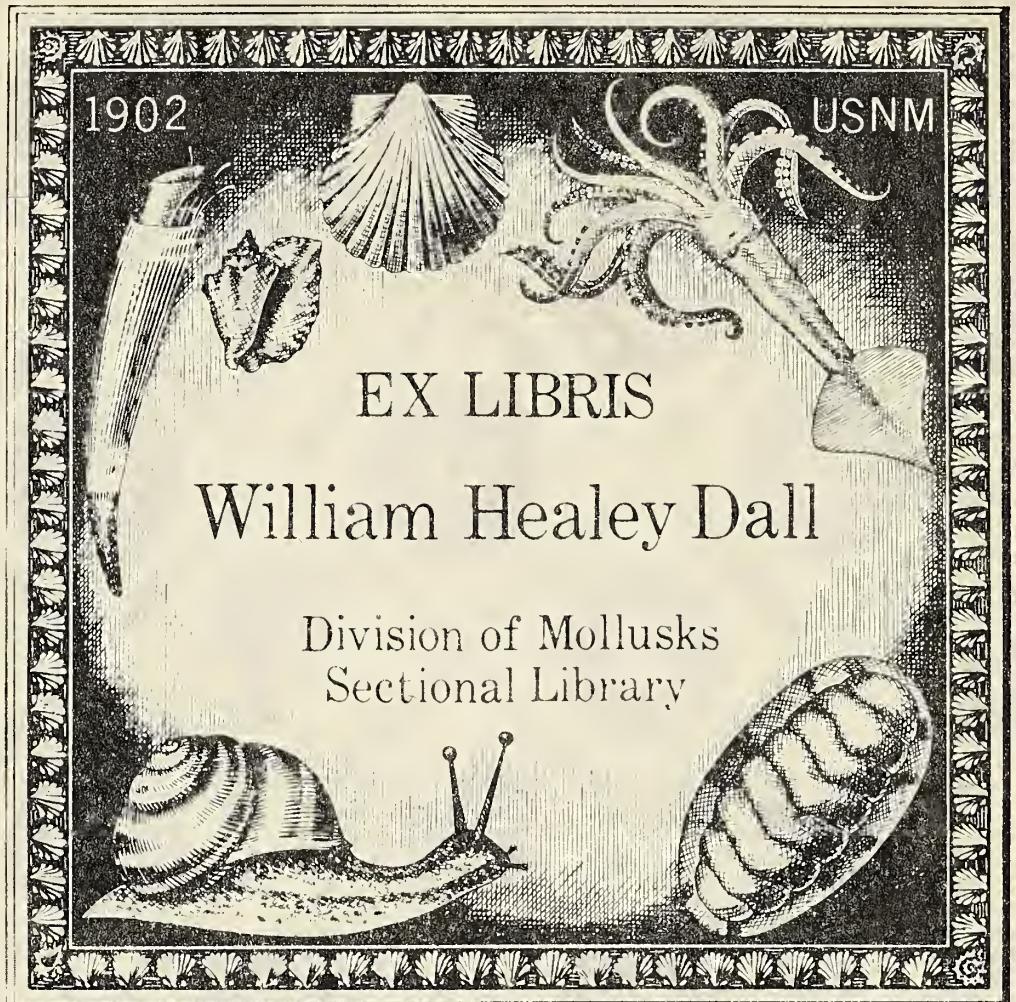


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# The American Malacological Union



## **Membership List Revised, April 1947**

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BLENN RIFE BALES  
Councillor, American Malacological Union, 1946.

## **BLENN RIFE BALES**

1876 – 1946

BY THOMAS L. AND PAUL L. McGINTY

With the passing of Dr. B. R. Bales, on October 25, 1946, members of the American Malacological Union have suffered an irreparable loss. Only two months previously he had been elected to the Executive Council of the Union at the 12th Annual Meeting in Washington, D. C. His services on the Council as well as his friendly presence as a fellow member will be sorely missed by all of us.

Dr. Bales was born July 18, 1876, at Lily Chapel in Madison County, Ohio, the son of John Foster Bales and Alice Rife Bales. Early in life he began to take an interest in natural science subjects, the collecting of bird-eggs being his specialty. In 1900 he was graduated from Starling Medical College, specializing in obstetrics. He took a post graduate course at the Lying In Hospital in New York City, and is credited with having increased the population of his home town, Circleville, Ohio, by delivering some 3500 babies. For forty years he served as surgeon for the Norfolk and Western Railroad. Dr. Bales served in hospital service in Puerto Rico during the Spanish-American War, having been a member of Company M, 4th Ohio Regiment. On June 6, 1900, he was married to Mary E. Jones, who, with their son and daughter, survives him. This union proved most fortunate, for he not only acquired a wife, but a devoted and capable helper as well. Mrs. Bales became his constant companion upon collecting trips and through their combined efforts the Bales collections grew and prospered. The priceless collection of bird-eggs, now in the Museum of Ohio State University at Columbus, Ohio, became unwieldy due to size, and Dr. Bales began to concentrate his efforts upon the study and collecting of shells. A tireless worker and splendid field-man, he had, before long amassed a shell collection which is probably the largest in the middle-west. It comprises 9000 varieties from all over the world. The collection is particularly rich in Florida shells, both from the west coast of the state and the Keys, where Dr. and Mrs. Bales collected extensively for the past decade or more. One particular locality, Bonefish Key, became famous as a collecting ground, due to the incredible numbers of new and rare shells which the Bales' succeeded in discovering. During 1938, Dr. and Mrs. Bales temporarily interrupted their annual winter sojourn on the Florida Keys, to drive southward into Mexico, where, principally at Acapulco, they encountered their usual success and collected a large series of fine shells, some of which proved to be new.

Among many newly discovered species of shells which are credited to Dr. Bales are several which were named in his honor. These include, *Euglandina balesi* Pilsbry, *Oxystyla ponderosa balesi* McGinty, *Asthenothaerus balesi* Rehder, *Barbatia balesi* Pilsbry and McLean, and *Pseudomalaxis balesi* Pilsbry and McGinty. Still others are in manuscript, as yet unpublished.

It was Dr. Bales who first called attention to a peculiar dwarf form of *Strombus* which he collected in Lake Worth, and later published as *Strombus raninus nanus* Bales. He was a regular contributor to the "Nautilus" and "Mollusca," where his articles were not only fascinating reading but contained much valuable information with regard to field-work. Of particular importance was his study and publication of hitherto unknown facts concerning those mollusks known as "rock-borers" and "chitons." It was Dr. Bales who proposed the American Malacological Union Symposium on "Methods of Collecting and Preserving Mollusks," and acted as chairman of the committee for its preparation. His own contribution, "Shore and Shallow Water Collecting," was an outstanding feature.

A forthcoming issue of the National Geographic Magazine will present an article pertaining to shells, with illustrations in color, taken from specimens in the Bales collection.

At the time of his death, he had nearly completed the manuscript for a book to be published under the title, "Meet Mr. Mollusk." This was to have included reminiscences of his wide collecting experiences as well as information of value to the collector.

Shell enthusiasts who travelled to Florida in recent years, sooner or later stopped by to visit and collect with "Doc," as he was affectionately known by his countless friends. His quarters on the Keys became a mecca for conchologists from far and wide and a favorite gathering place. His was a helping hand, gratefully received by beginners and professionals alike. In Dr. Bales they found a warm friend and a source of radiant enthusiasm and good cheer, which, coupled with his keen zest for living, was most contagious and felt by all. There was laughter in his heart and being, and life for him was a joyous affair to be lived to the fullest through his seventy active and happy years. But to have known Dr. Bales, was to have loved him.

**THE AMERICAN MALACOLOGICAL UNION  
TWELFTH ANNUAL MEETING  
WASHINGTON, D. C., August 14 to 16, 1946**

It was good to be there, and a pleasure to meet again after the long war years when such meetings were made impossible by transportation and other restrictions. A more delightful spot could hardly have been found in the country than was Washington in mid-August, 1946. So thought the fifty members of the American Malacological Union and their friends who came from ten States to the Twelfth Annual Meeting, August 14 to 16.

The convention was opened formally Wednesday afternoon, August 14, when Dr. Alexander Wetmore, secretary of the Smithsonian Institution, welcomed the delegates to the facilities of the Museum for this second meeting of the Union to be held in the Capital. Since the former meeting in 1932, Dr. Paul Bartsch, who then was head of the Department of Recent Invertebrates, was retired and Dr. Harald A. Rehder was promoted to the curatorship of the Division of Mollusks and served as our host for this occasion. Dr. J. P. E. Morrison, who so actively assisted in entertaining the group during our first Washington meeting was away studying reef life in Bikini.

Dr. Henry van der Schalie, President of the Union, responded to Dr. Wetmore's address. He expressed appreciation for the courtesies extended and voiced the general feeling of the group concerning the delighted surprise at finding Washington weather so cool in mid-summer.

The first paper on the program was by Richard I. Johnson on "Unionidae of New England." Of the 500 species of American Unionidae the Mississippi River forms are most remarkable. China is the only other country where comparable forms exist. The Mississippi forms exhibit a great range in variety of outline and sculpture with nacre of various shades of purple and pink to white, while the twenty-two species of the Atlantic drainage in New England are relatively simple in outline with little or no surface sculpture, and the nacre is almost always white and of no great brilliance. New England is essentially an island cut off from the rest of the continent by the Hudson and St. Lawrence Rivers, Lake Champlain and the Champlain Canal, and thus the western limits of certain New England species are well defined. The restriction of range which the parasitism of the young imposes makes a study of the habitats of host fishes important. *Elliptio complanatus* was cited as an example of a species which is widespread throughout New England and other parts of the country, due probably to the fact that it will parasitize several species of fish, whereas *Anodonta implicata* will parasitize only the alewife which frequents only coastal streams and therefore restricts the range of this unionid.

Dr. van der Schalie remarked that there are several problems in the Lake Champlain unionid fauna awaiting solution by such researchers as Mr. Johnson.

Dr. Willard R. Wright was the next speaker, reporting on "The Distribution of Schistosomiasis japonica in Mindanao, Philippine Islands." The report was prepared by Dr. Wright, Donald B. McMullen, Ernest Carroll Faust, and Preston E. Bauman. Commission on Schistosomiasis, Commission on Tropical Diseases, Army Epidemiological Board, Preventive Medicine Service, Office of the Surgeon General, War Department, Washington, D. C. "In addition to the known endemic foci of Schistosomiasis japonica in Surigao and Agusan Provinces (Tubangui and Pasco, 1941), surveys carried out in July and August, 1945, indicated additional endemic areas near Valencia, Province Bukidnon, and in the Capasagan River valley, Province of Lanao. Twenty-three cases of the disease were diagnosed in Filipino civilians in hospitals in and near Valencia. In nearly all cases, infection was probably acquired in two places, Barrio Simaya and Sitio Inawaan, northwest of Valencia. Cases of the disease were diagnosed and infected *Oncomelania quadrasi* were collected near the Barrio Calasig, northeast of Lala, Province of Lanao. Additional persons from other barrios in this vicinity were found infected.

"The disease was not encountered in an area around Davao. No *O. quadrasi* were discovered in this area although search was limited because of enemy forces. However, there is evidence to indicate that American prisoners of war contracted the disease near the Davao Penal Colony which our survey party was unable to reach. Stool examinations and small surveys in the rice growing sections on the eastern shore of Lake Lanao failed to indicate that *Schistosomiasis japonica* is endemic in this region. No specimens of *O. quadrasi* were found in the area, although subsequently the snail was discovered in a single small focus on the north shore of the lake (Abbott, 1946)."

Dr. Eloise B. Cram was next on the program, reporting on "A study of Native Planorbidae as Possible Intermediate Hosts of *Schistosoma mansoni* in Man."

"*Schistosoma mansoni* is a trematode parasite living as adults in the blood vessels of the intestines and liver and there depositing eggs which eventually reach the lumen of the intestine and are there expelled with the faeces. Under favorable conditions a larval form of the trematode hatches in water and its further life is dependent on the presence of a suitable snail host, in which it can develop and multiply and in about four weeks' time reach a stage infective for man. From a public health point of view our principal interest lay in the question as to whether or not we have in the continental United States species of snails capable of serving in this capacity of intermediate host. If such were the case the return of our own military personnel and the increasing travel of civilians to and from areas in which the disease is endemic might provide opportunities for the establishment of the disease in this country. Because of the fact that the known intermediate hosts of *S. mansoni* are Planorbidae, we undertook to test as many species of this family as possible." "38 persons co-operated in the collection of Planorbidae from 19 states and the District of Columbia. 25 species and sub-species belonging to seven genera were represented. Laboratory colonies were established and representatives of twenty-two species and subspecies belonging to *Gyraulus*, *Helisoma*, *Planorbarius*, *Planorbula*, and *Tropicorbis*, were exposed to miracidia of *Schistosoma mansoni*. With one species only were positive results obtained; nine specimens of *Tropicorbis* identified as *T. havanensis* (Pfeiffer) proved

susceptible to infection. Cercariae which developed in this snail were utilized for the infection of mice with subsequent development of adult *S. mansoni.*"

Ralph W. Dexter followed with "Notes on the Mollusks Attached to the American Lobster." Observations were made on the following organisms attached to the American lobster (*Homarus americanus*) during the summers of 1945 and 1946 at the State Marine Hatchery at Noank, Conn. In June of 1946 a sample of 538 female lobsters in berry taken from Fishers Island Sound were examined. These averaged two pounds in weight and their shells were nearly two years old—the oldest ever attained by the lobster. A total of 425 lobsters contained fouling organisms; 121 of these had mollusks attached. Five species of mollusks were found as follows: *Anomia simplex* and *A. aculeata* were found on 16% of the lobsters. All but three specimens were *A. simplex*. These bivalves were attached chiefly to the claws, among the teeth of the claws, and on the carapace. *Mytilus edulis* was found on 4.6% of the lobsters, attached for the most part between the exopodite and endopodite of the uropods. *Crepidula glauca* and *C. fornicata* were found on 1.8% of the samples mostly on the uropods and the claws. All but two specimens of this genus were *C. glauca*. Of 198 new-shell lobsters captured in closed traps in Fishers Island Sound between July 1 and August 12, 1946, 52 carried fouling organisms, but only one mollusk, a single specimen of *A. simplex*.

Gordon K. MacMillan gave "A Biographical Sketch of Jacob Green, Conchologist." Jacob Green was born in Philadelphia on July 26, 1790. He received his A.B. degree from the University of Pennsylvania in 1807. In 1812 he was elected an honorary member of the class of 1812 at Rutgers College and given an A.B. degree which three years later was changed to A.M. In that same year Princeton awarded him its A.M. *gratiae causa*. In 1825 he was called to the newly established medical school at Jefferson College where he became the first professor of chemistry. While there he collected natural history specimens in the vicinity, among them numerous land shells. He extended his studies to the Ohio River where he found several species of unios. Yale bestowed on him their medical doctorate in 1827, but his studies in mollusca were continued. Two new species of *Achatina* from the Sandwich Islands were described (*Achatinella stewarti* and *A. oahuensis*). In 1828 he realized the fulfillment of a long-cherished dream to visit Europe where he had the good fortune to see the aged Lamarck on what was probably his last public appearance.

Although actively engaged all the while in chemistry, botany, physics, mineralogy or other fields of science, he still was able to give to the world in 1833 a Monograph of the Trilobites of North America with colored models of the species, and in 1834 more descriptions of land shells and Doliae. Jefferson College awarded him an honorary degree of Doctor of Laws as a tribute of appreciation of his achievements in the field of experimental science. He died February 1, 1841, after a long and happy life of unusual activity in many fields.

The concluding paper of the session was by Dr. Henry A. Pilsbry on "The Limaces of North America." The study of the Limaces or slugs never has been popular, perhaps because of the slimy character of the animals. Nearly all the slugs of eastern North America are introduced, such as the

huge *Limax maximus*, *L. flavus*, and *Deroeras reticulatum*, the gray slug. The commonest slug is *D. laeve* formerly known as *campestris*. It is found everywhere in North America as well as in Europe and Siberia, and, with the exception of the Philomycidae, is the only native slug we have in the east. The imported slugs are confined to cultivated areas and therefore are found in cities while this little creature occurs in woods as well as gardens.

The eastern slug which was formerly supposed to be *D. agreste* has been shown to be *D. reticulatum* of eastern Europe. Fossil slug shells from Kansas are not like living species, being larger and thicker and with strong growth lines, but they group with the western species. These facts suggest that they came to North America from Western Palearctic regions during the middle tertiary or pliocene. An invasion by way of a Bering Sea land bridge permitted them to spread southeast into western America, and perhaps south into Mexico where species appear to be related more to groups of eastern Asia than to North American groups. It seems certain that they are immigrants and that these fossil recently described by A. B. Leonard are survivors of them. Some time in the Pleistocene another invasion from Asia took place and the only species to survive is *D. laeve* which has spread over the continent and still is here.

The annual dinner was held at eight o'clock Wednesday evening in Annapolis Hotel when Dr. Bartsch was especially honored on the occasion of his seventy-fifth birthday. Dr. Waldo Schmitt, Dr. Bartsch's successor as head curator of the Museum, was the first speaker. He had been a former student under Dr. Bartsch and paid tribute to him as a loyal friend during many years of their association. Dr. Pilsbry followed, saying that when he first knew Dr. Bartsch he was an ornithologist but that he fell more and more under the influence of Dr. Dall and eventually made mollusks his chief concern, selecting little known groups for study. He has many volumes on land operculates to his credit and his name is well known for his studies of west coast marine species. Now that he has retired he probably will turn out many things to surprise us yet. William J. Clench remembered that in 1914 Dr. Bartsch was even then more or less of a legendary hero, more or less a standard to aim at in his field. He will long be remembered for what he has done for so many in encouragement and advice. Dr. Fritz Haas had worked in European institutions where he learned to admire and respect Dr. Bartsch. Even when in high school two of his teachers, in speaking of workers in other countries, referred to Dr. Bartsch in Washington as the only man besides Möllendorf who knows about Philippine land shells. He concluded his remarks by saying, "I am almost thankful to Hitler for forcing me out of Germany to the United States to meet Dr. Bartsch personally." Dr. Jeanne Schwengel spoke of Dr. Bartsch as a helpful friend and sponsor, and Mrs. Harold R. Robertson expressed gratitude for many helpful acts in the work of the Union of which he is one of the most important pillars. She then, on behalf of the Union, presented a handsome electric clock for his new home "Lebanon," accompanied with a beautifully hand-engrossed birthday card bearing the signatures of all present.

Dr. Bartsch responded feelingly giving reminiscences of his long life spent in the pursuit of science, fifty years of which had been in the service of the Smithsonian Institution where he went in 1896, as a young man in his early twenties, to become assistant to Dr. Dall. During the years he had

acquired wisdom as well as knowledge from association and experience, on expeditions and in the performance of such duties as fall to the lot of a curator, dispensing information on the thousand and one questions which come to an institution of learning in the course of the day's routine. There is not a country on the globe which has not sent representatives to the Smithsonian Institution for help, and no question is ignored. In the matter of identification for which so many requests are received daily, the only certainties are genotypes; everything else can be questioned. This service represents but one instance of why the work of a curator is exacting and time consuming. Dr. Bartsch looks forward now to doing some of the many things which have been held up by such routine. He feels that the work of the Department is in good hands. Dr. Rehder and Dr. Morrison will carry on to even greater heights because of better tools and methods now available.

The Thursday morning program was opened with a paper by Dr. Elmer G. Berry on "Members of the Genus *Tropicorbis* found in Louisiana and Texas." *Tropicorbis* is a planorbid genus distributed roughly from Argentina and Brazil to Louisiana and Texas. It is allied to *Australorbis*, species of which are hosts to *Schistosoma mansoni*. Consequently *Tropicorbis* was selected for study in a program to test which species might take a Schistosome infection. The shells are very flat and discoidal with four to six whorls. The species are sufficiently transparent that the pigment of the animal is clearly shown through the shell. The aperture sometimes is toothed though not all specimens bear lamellae. Ribbed specimens from the spillway near New Orleans were found to be infected; others from Audubon Park, with smooth surface, were not infected.

The next paper was by Ruth D. Turner on "Procedure in the Collecting and Study of Boring and Fouling Mollusks." The damage caused by Teredinidae or ship worms and the money spent each year to guard against their ravages far exceeds that realized from the sale of oysters, scallops, and all other beneficial mollusks. Systematic studies looking to the control of these destructive mollusks were not commenced until after a severe invasion of San Francisco Bay in 1919-21. At that time a nationwide study of the problem was instituted and the work is being continued by many government and private organizations. Collecting panels employed in these studies are constructed of eight boards and a control supported on an iron bar and suspended in a vertical position two feet above the mud-line. Each board is 12" by 6" by 2" made of soft wood free from knots. They are numbered from No. 1 to No. 8 and are fastened on the iron bar about two inches apart, the control being placed between numbers No. 4 and No. 5. After one month boards No. 1 and the control are removed and new boards put in their places. At the end of the second month boards No. 2 and the control which has been submerged for one month are removed and replaced and so on to board No. 8 which has been in for eight months. From this series it is possible to ascertain the speed of growth of the borers over an eight month period, while from the control it is possible to obtain data on the breeding seasons. Special collecting boards may also be used. These are nothing more than long strips of wood which extend from the mud-line to high water and from them it is possible to learn the exact depth at which the borers are most active.

The laminated collecting board is actually a trap for catching good specimens, and should be used mainly for obtaining specimens for taxonomic

studies. The board is made up of six layers of soft, straight-grained wood 12" by 6" by  $\frac{1}{2}$ " with washers separating the layers to form cracks large enough so that the shipworms cannot cross from one layer to the next. Consequently the borers form long straight tubes and as the wood is thin they are easily extracted. For best results it is necessary that the animals be dissected as soon as the board is removed from the water, or, if this is impossible, the board should be submerged in 70% alcohol for a week and then shipped to the laboratory wrapped in a cloth saturated with alcohol.

Distributional records should be taken only from test boards or collecting boards as borers are easily transported from one locality to another in drift wood.

John Dyas Parker was the next speaker, his subject, "Hunting Fossils in the Florida Miocene." Mr. Parker prefaced his remarks by a plea for help for the Museum in Manila which was totally destroyed during the war. The St. Petersburg Shell Club has answered the call which has been sent out for books for the library and specimens for the museum. They plan to have an exhibition in St. Petersburg February 6 to 12, 1947, the proceeds to be used in buying books and specimens to aid in the restoration. All members of the American Malacological Union are asked to assist if possible, sending donations to the St. Petersburg Shell Club in care of the St. Petersburg Chamber of Commerce.

Speaking on his topic, Mr. Parker gave a graphic and diverting account of his adventures in April, 1946, in quest of Miocene fossils at Jackson Bluff a short distance west of a community named Bloxham in northwest Florida. Starting from Tallahassee at 8:45 A. M. they were at Bloxham by 3:30 P.M. and ready for the search. Harvey's Creek had been indicated as the goal, and when John Harvey was discovered in the person of a Florida cracker who confessed to having taken a "scientist man" to a certain spot on the bank of the creek in 1923, the problem of location was solved. Mr. Harvey's services eventually were enlisted and over a ton of fossil-bearing material collected, notwithstanding the original site was under water due to the construction of a dam in 1934. It was only by sinking a shaft into the deposit that the fossils were obtained.

The afternoon session was opened with a brief business meeting for the election of officers which resulted as follows: President, Dr. Henry van der Schalie; Vice-president, Dr. Myra Keen; Treasurer, Harold R. Robertson; Secretary, Imogene C. Robertson. Dr. Blenn R. Bales and John Q. Burch were elected Councillors, and Dr. Joseph C. Bequaert and Dr. John Oughton were reelected Councillors. Past presidents remaining on the Council without reelection are: Dr. Joshua L. Baily, Jr., Dr. Horace B. Baker, Dr. Paul Bartsch, William J. Clench, Calvin Goodrich, Dr. Louise M. Perry, Dr. Henry A. Pilsbry, Dr. Harald A. Rehder, Maxwell Smith, Dr. Carlos de la Torre.

The place of meeting in 1947 was discussed, and it was decided to leave the selection to a vote by mail of the entire membership. An invitation had been received from Andrew Sorensen and the Pacific Grove Chamber of Commerce and the Hopkins Marine Station, to hold the meeting in Pacific Grove, California, but a number favored a meeting at Sanibel.

Then followed a showing of a short film in color taken at the meeting in Rockland, Maine, in 1941. The film contained glimpses of the three following deceased members: Frank Collins Baker, Norman W. Lermond, and Olof O. Nylander. Also recorded were scenes which forecast the later marriage of Bernadine (Bunny) Barker and Horace B. Baker. Pleasant memories were recalled briefly by this showing of the large group which was in attendance at that Maine meeting.

Dr. Fritz Haas was the first speaker in the program of papers which followed and his subject was: "Shell Sculpture in Normally Smooth Unionid Shells." Specimens of several species were shown on the screen which exhibited sculpture not mentioned in the descriptions. Dr. Leonard recalled that sculpture noticeable in young shells frequently is lost as the shell matures. Dr. van der Schalie said this feature is very variable in *Quincuncina*.

"Problems Relating to Molluscan Faunal Zones in Late Tertiary and Pleistocene Deposits in Kansas" was Dr. A. B. Leonard's topic. Charts and photos of the formations were shown elucidating the subject which posed problems of climate and soil conditions deduced from the character of the molluscan fauna.

William J. Clench, speaking on "Looking Forward in Malacology" said that the past war had highlighted many features in our own field, such as the necessity of bringing together all malacological data so as to make it available for students and health bureaus. Information on poison Cones should be disseminated where needed. Four species have caused eighteen deaths. What poison is it? It must be very virulent as the organ secreting it is no larger than a hair. There is reason to believe that *Thais patula* may be poisonous. Certain cephalopods have long been known to use venom in paralyzing their prey. In another field the dietary value of oysters may be a fruitful study in the treatment of anemia. Oysters contain copper as does *Strombus*, which is particularly rich in this mineral. It has been observed that Negroes are not afflicted with anemia where they feed on this mollusk, perhaps due to the beneficial effect of the copper present.

Experimental work to solve marine wood-boring problems in molluscan control is being carried on with test boards in many regions, and this method of study should be continued and expanded. Published material should be collected to facilitate study. The recent work on Land Shells of North America by Dr. Pilsbry and Johnsonia are efforts in this direction. Amateurs can do valuable work in the study of life histories and the compilation of local lists. This last endeavor is important since habitats are being destroyed by pollution from industries and the changes effected by power dams. The speaker said that there is more interest in shells now than ever before and that we are entering the Golden Age of Conchology.

"Searching for Mollusks along the West Coast of Mexico" was Andrew Sorensen's topic. He gave a picture of collecting in waters where mollusks are abundant both in kind and number. Although Californian waters are prolific those of Mexico surpass them, and his account of the collecting possible both in California and in Mexico stirred his hearers to resolve to experience it for themselves if at all possible.

Dr. Katherine Van Winkle Palmer was the last speaker on the formal program, and her subject was: "The Types of Philip P. Carpenter." Philip

Pearsall Carpenter, an Englishman (1819-1877), was an important contributor to early American conchology, particularly to the study of the molluscan fauna of the West Coast of North America. Large shell collections were deposited by Carpenter in American institutions but their existence has been overlooked. Of over 250 molluscan species described by Carpenter from the West Coast of the United States, north of San Diego, only a small proportion have had the types figured or the species illustrated. The location of the types has not been generally known. It is planned to locate as many as possible of the Carpenter types of the species described from the area mentioned and to illustrate them. Most of the types have now been found. The figures are to be published, together with notes on the species and of Carpenter's life.

At the close of the program William J. Bower added a few words on the splendid work being done by Dr. Merrill Moore who uses shells in the treatment of nervous disorders among war victims in hospitals as well as for arousing an interest in the intrinsic value of beauty in life. He cited the case of a bedridden cripple who has become a lecturer on shells and is in demand for Boy Scout groups and others to whom she urges the study and collection of shells in making life more full and happy.

Mrs. Fred St. John Hoffman concluded the session with an account of her distribution of the Eleventh Annual Report of the Union which contains the Symposium papers on Methods of Collecting and preserving Mollusks, to boys in the South Pacific who became interested in shells of the area while stationed there. The making of shell jewelry for their mothers, wives, and sweethearts, became a popular pastime, and some developed a genuine scientific interest in the subject of mollusca.

The scientific sessions were adjourned at this point until another year.

At six o'clock members reassembled, this time as guests of Dr. Jeanne Schwengel and her husband, General Frank R. Schwengel, at a cocktail party and buffet supper in the Washington Hotel. This was a delightful occasion, giving opportunity for friendly intercourse as congenial groups gathered at the tables to partake of a delectable meal. Later in the evening the group was invited to the National Aquarium as guests of the Director, Fred Orsinger. This venture gave the Union members an opportunity to get behind the scenes in the Aquarium where the animals demonstrated remarkable response to the attendants toward whom they behaved as friends.

Friday morning dawned mistily, but this did not upset the plans for the outing to "Lebanon" the 450-acre estate which Dr. Bartsch and his wife, Dr. Elizabeth Parker Bartsch, are restoring to its former colonial dignity. The thirty mile drive was through Alexandria over the highway to Mount Vernon with here and there a glimpse of a mansion which had been the home of one of George Washington's relatives or neighbors. A short distance beyond Mount Vernon is Pohick church where a stop was made to inspect this reminder of the days when it was built for the convenience of worshippers in the vicinity including the Washington family who found the long drive to Alexandria on Sunday morning a damper on their religious zeal. The simple dignity of the architecture induces a feeling of reverence and humility regardless of creed. A generous collection was left in the bag at the altar as a souvenir of our visit.

Arriving at "Lebanon" the thirty or more guests were immediately at home in the peace and quiet of this lovely countryside where the Bartsch's plan to spend the greater part of their time in the study of its natural history and the cultivation of its gardens. The rain restricted the collecting which had been anticipated, but a few venturesome souls made a dash to a hedge where living specimens of *Haplotrema concavum* were found, the sole trophies for the day.

A buffet luncheon featuring a variety of delicious salads was thoroughly enjoyed, and then came a drive to Gunston Hall, the former home of George Mason, author of the Bill of Rights. This colonial mansion was purchased by Louis Hertle in 1912, and he and his wife restored the house and grounds to their original condition of dignified grandeur. In 1932, after the death of his wife, and as a memorial to her, Mr. Hertle presented the estate to the State of Virginia retaining a life-tenancy for himself. The National Society of the Colonial Dames of America is to be its future custodian.

Mr. Hertle graciously welcomed his visitors on the present occasion and invited them to inspect the rooms which are furnished in all the beauty of southern colonial luxury at the height of Virginia's social prestige in Revolutionary days and before. The house faces the Potomac a view of which may be had at the end of a wide grassy walk bordered with a box hedge eleven feet high clipped with geometrical precision. At the far end of the walk is a sunken garden with formal gardens on either side. This visit was greatly appreciated and did much to compensate for the disappointment caused by the rain in curtailing collecting.

Back to "Lebanon" for another cozy period of conversation and refreshments in the form of luscious watermelons thoughtfully supplied by Dr. Julia Gardner, and then the final leave-taking as the Twelfth Annual Meeting of the American Malacological Union became a memory.

## MEMBERS AND VISITORS IN ATTENDANCE

Dr. Paul and Dr. Elizabeth Parker Bartsch, Washington, D. C.

Dr. and Mrs. Elmer G. Berry, Jacksonville, Fla.

William J. Bower, St. Petersburg, Fla.

Mrs. Marion Castor, Philadelphia, Pa.

William J. Clench, Cambridge, Mass.

Mrs. Lilius F. Cockerill, Sanibel, Fla.

Miss Margaret Contant

Dr. Eloise B. Cram, Bethesda, Md.

Dr. Ralph W. Dexter, Kent, Ohio

Dr. Julia Gardner, Washington, D. C.

Joseph S. Gaylord, East Longmeadow, Mass.

Dr. Fritz Haas, Chicago, Ill.

Mrs. Fred St. John Hoffman, Buffalo, N. Y.

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### THE THIRTEENTH ANNUAL MEETING

In accordance with a decision made at the Washington meeting, ballots were sent to the membership in November to determine the place of the 1947 meeting as between Sanibel, Pacific Grove, and Carnegie Museum. By December 1, the date set for final returns, Sanibel was slightly in the lead.

Accordingly steps were taken to appoint a local committee to make arrangements for a meeting there. However, when those contacted for the purpose advised against the Sanibel selection at this time because the devastation wrought by two hurricanes had not been repaired and accommodations on the island were inadequate, and that shelling is not what it formerly was, it was decided to accept the invitation from Pacific Grove, a close second in the voting.

Mr. Andrew Sorensen and the Directors of Hopkins Marine Station have selected the dates of June 18 to 21 when tides are very low early in the morning and collecting should be good. The headquarters for the meeting will be Asilomar Hotel and Conference Grounds, operated by the Y.W.C.A. Attractive living quarters and conference halls make it possible to hold meetings at any time, all activities being right "at home." The rate of \$3.50 a day including meals appeals to those who must come a great distance and to whom expense is an item to be considered. There also are rooms for \$5.00 and \$5.50 a day if desired.

Asilomar is 120 miles south of San Francisco and easily reached. Visitors are promised a trip to Hopkins Marine Station, the Pacific Grove Museum, and a view of the beautiful submarine gardens through glass-bottomed boats.

Please send titles of papers and time required to Mr. Andrew Sorensen, 247 Granite St., Pacific Grove, Cal. Also make reservations with him as soon as possible.

## NOTES

William J. Bower sends the following interesting note on the Egg-Laying Process of *Strombus pugilis* which he was fortunate enough to observe. He was present when Mrs. Mary J. Coles of Nashville was collecting shells for the new Nashville Children's Museum, May 11, 1945 in Boca Ciega Bay at the foot of 31st Street South, St. Petersburg, Florida.

The shells were on a bar of clean white sand about 150 feet out from high tide mark. As the tide ebbed the shells began to pop out of the sand. Seven of the 122 examined were laying eggs. They were partly buried in the sand with the lip of the shell exposed. The eggs emerged from the animal inbedded in a continuous string of matter about a millimeter in diameter. The string piled up into a loose ball about the size of an English walnut in the space between the lip of the shell and the sand. Microscopic examination showed the egg string to be composed of small grains of white sand agglutinated by an albuminous substance. As the egg string did not pass through the sand the mollusk apparently takes in the sand and fabricates the egg string around the eggs as they emerge.

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Yoshio Kondo writes: There is a little matter which, I believe, could be brought to the attention of the members with profit to both themselves and the natives of the Caroline Islands.

The United States Commercial Corporation, as one of its minor projects, will encourage natives of Truk, Yap, Palau, and other islands thereabouts to collect seashells to be sold in the States. The purpose of this project is to enable the natives to buy some necessities until the fishing, agricultural, and mining industries are put on their feet again.

We have advised one of their representatives that the trochus and pearl shell industries, for button material, could be revived immediately and that there may be a good market for the giant tridacna shell as a curio. The curio shops of Palau almost always used to have a mound of the latter shells in front of them for sale which was quite brisk. I myself brought home four or five pairs of those giants. Some of the large specimens are said to be large enough to bathe in. At and near Yap are good grounds for the orange cowrie. These will probably find readier sale than the less spectacular shells that the natives may manage to bring up. We have advised them that shells other than the commercially important ones are to be picked up and marketed though the returns may not be high.

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Adlai B. Wheel writes that he has received several donations of shells from members who read the appeal in the last *Bulletin*. He is very grateful for all these. The shells have been put to good use in his work with the Boys' Club of Syracuse. The portable displays which the boys have arranged to illustrate different families of mollusks are carefully and neatly done and would do credit to any school or museum. Keep Mr. Wheel and his boys in mind when you have duplicates for disposal. The address is Adlai B. Wheel, 430 E. Genesee St., Syracuse, N. Y.

John Dyas Parker reports on the Third Annual National Shell Exhibition held under the auspices of the St. Petersburg Shell Club in the Grand Ballroom of the Million Dollar St. Petersburg Municipal Pier on February 6 to 12, 1947: In place for the opening were 385 running feet of glass cabinets, each filled with shells. Other exhibits included two relief maps, one of the State of Florida and the other of the local area, each of which had real shells placed where they are found geographically. Another interesting exhibit was a reproduction of a sand bar from Tampa Bay which had simulated tracks and the shells of ten species of mollusks.

The largest exhibit was submitted by the Academy of Natural Sciences of Philadelphia, with an overall length of 100 feet. This exhibit showed different types of dredging and collecting equipment. Four workers were kept busy sorting, dissecting, and drawing local dredgings brought in from Tampa Bay. Also included in the Academy exhibit were a library section which contained at least one work of each of sixty-three staff members, past and present, starting with Thomas Say and running to Dr. Henry A. Pilsbry's latest part of the *Land Shells of North America North of Mexico*. A sample shell cabinet, a filing and a catalog system completed this exhibit. A lecturer at frequent intervals covered the whole process of shell collecting from dredging to the ultimate cataloging and disposition in the cabinet.

Participating in the exhibit were 74 private exhibitors from 37 states, Canada, and New Zealand, and five Museum groups including two of the major institutions doing research on shells, as well as 41 shell dealers who had concession booths. According to a private census conducted by Joseph Gaylord there were a little over ten thousand shells of five thousand species represented in the show. Over 5000 people other than those connected with the club or concessions came to see the shells.

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Membership in the American Malacological Union is open to anyone interested in the study or collection of shells. The annual dues are one dollar. There is no initiation fee. For further information address the financial secretary, Mrs. Harold R. Robertson, 136 Buffum Street, Buffalo, N. Y.

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**IN MEMORIAM**

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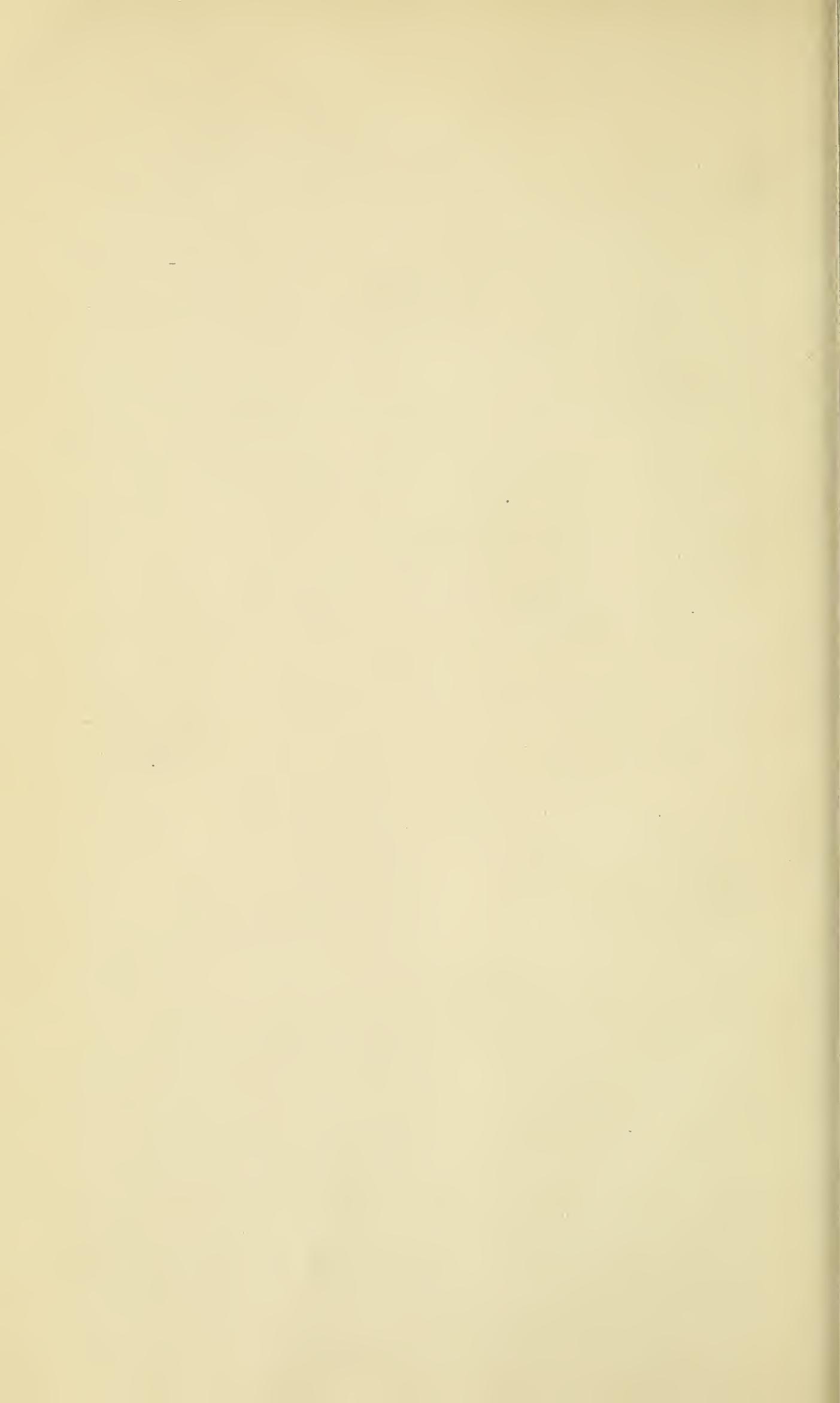
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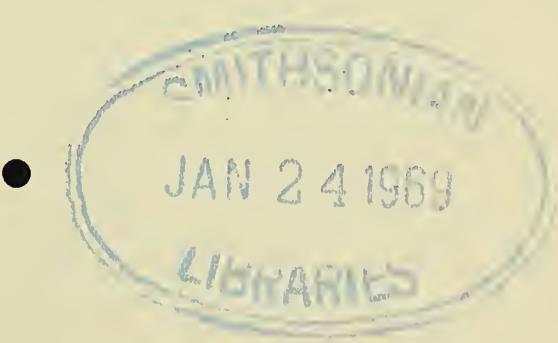
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The American  
Malacological Union

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Membership List Revised,  
December, 1947

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# **THE AMERICAN MALACOLOGICAL UNION**

## **THIRTEENTH ANNUAL MEETING**

### **PACIFIC GROVE, CALIFORNIA. JUNE 18 TO 21, 1947**

For the second time since the end of World War II, members of the American Malacological Union gathered together. It was the first meeting to be held on the Pacific Coast since 1934. The attendance, which was naturally composed largely of Pacific Coast members, nevertheless included a fair representation from the Eastern States. The total number in attendance was 86, mostly members of long standing, but including also a number of newcomers who were attending for the first time.

The meeting was held at Pacific Grove, as announced in the last issue of the "News Bulletin and Annual Report," at the invitation of Mr. Andrew Sorensen and the Directors of the Hopkins Marine Station. They promised much in the way of attractions and entertainment and they more than fulfilled their promises.

The place of meeting was Asilomar Hotel and Conference Grounds, operated by the Y. W. C. A., which deserves more than passing mention. Asilomar is beautifully situated on the shore of the Pacific, a stone's throw from an attractive beach which provided some surprises in the way of mollusks for the non-Californians, as will be recorded later. It consists of spacious grounds with a carefully preserved stand of Monterey cypress and other native trees and a group of well spaced buildings including dormitories, cottages, conference halls, recreation halls, offices and dining halls. Few more beautiful and convenient meeting places could have been found, even in the opinion of those familiar with California and other Pacific Coast states. The arrangements for meals were particularly convenient. Members of the Union had all their meals at a group of reserved tables in the dining hall which were screened off from other groups and permitted them to continue the meetings informally with complete freedom from extraneous influences.

Long before the earliest arrivals were expected, the local committee had been at work. On arrival, Mrs. A. T. Whelchel and her father, Mr. Sorensen, were on hand to welcome us and Mrs. John Q. Burch was ready to attend to registration and the assignment of rooms for the duration of the meeting. As a pleasant surprise, each registrant was presented with a box containing named shells from the Pacific Coast, the gift of Messrs. Sorensen and Strohbeen and Mrs. Whelchel. As usual, introductions were soon attended to and the conversation turned immediately to Mollusca. Most of the afternoon of the 17th, was spent in this pleasant manner and in the renewal of old acquaintances or the making of new ones.

During the evening of the 17th members were invited to view an exhibit of sponges, sea plumes, crabs, starfish, brittle stars, glass sponges, brachiopods, and corals brought up by fishermen and expertly preserved and mounted by Mr. Strohbeen. Mr. Sorensen had prepared a fine display of abalone shells from California and other parts of the world to illustrate his paper, given later. The evening was enjoyably spent discussing the exhibits and questioning Messrs. Strohbeen and Sorensen about them. The group became larger and larger as time passed and new arrivals continued to join it. Even before the meetings had officially started, it was apparent that a large and appreciative group would be present to make a success of them.

WEDNESDAY, JUNE 18, 1947

The first scientific meetings were held in the Classroom Hall, Asilomar, Pacific Grove, California. Dr. Henry van der Schalie, President of the Union, opened the meeting at 2:10 p.m. After a few general announcements relating to a photograph of the group and the Annual Dinner to be held on the same evening, Dr. L. R. Blinks, Director of the Hopkins Marine Biological Station of Stanford University, was invited to speak.

Dr. Blinks said it was a pleasure and an honor to welcome the American Malacological Union to Pacific Grove and to the Hopkins Marine Laboratory of Stanford University. He said that the Laboratory had now started its summer session with some forty students in attendance and that some thirty or more were expected later. Pacific Grove had been selected as the site of the station because of its advantages from the standpoint of abundant fauna and flora and its accessibility. Monterey Bay has a rich fauna of over 1,000 species of animals and plants, of which 400 are usually found. There are a great many species of Nudibranchs, 50 of Chitons, and 500 or 600 of Mollusks. Abalone and Squid of commercial importance are found and taken here; the squid is also of embryological and physiological importance. Dr. Blinks concluded by inviting members of the Union in attendance at this meeting to visit the Laboratory and to make it their home insofar as possible.

Dr. van der Schalie responded to Dr. Blinks' address of welcome; he said that the site, the climate, and the facilities of Pacific Grove exceeded the expectations of all those who had come from far and near. He lauded the excellent arrangements made by Mr. Sorensen and Dr. Blinks and their many enthusiastic assistants for their efficient organization of the meeting.

The meeting then passed to the presentation of scientific papers according to the programme. These are abstracted below, together with the discussion that followed each one.

#### THE MARINE MOLLUSKS AND BRACHIOPODS OF MONTEREY BAY, CALIFORNIA, AND VICINITY. BY ALYN G. SMITH AND MACKENZIE GORDON, JR.

This paper was read by the senior author who said that it would soon appear in print. Mr. Smith said that the fauna of Monterey Bay is exceptionally rich in species and individuals and that therefore he would confine himself to a discussion of the Mollusca. The area has had a long history, malacologically speaking, which goes beyond the beginning of formal scientific literature. The early Spanish records of the region contain descriptions of the uses of abalones from Monterey by the Indians of the West Coast, even as far north as Alaska. The first scientific collections reached Europe at the beginning of the 19th century; they included the Black Abalone, the Red Abalone, the Giant Keyhole Limpet, *Olivella biplicata*, and the Coffee-Bean Shell, *Trivia californiana* Gray.

The expeditions of Lapérouse (1787) and Vancouver (1795) may have obtained some of the species described by early conchologists, as both were accompanied by naturalists. Nuttall (1835), Du Petit Thouars, (1838), and many others obtained specimens from Monterey Bay. Carpenter (1856, 1863) summarized the earlier exploration of the coast and concluded that 277 species of shells were known from California, of which 66 were reported from Monterey Bay. More intensive work was done by J. G. Cooper (1861), Dall (1865-66), Stearns, Newcomb, Canfield, and Harford.

As early as 1890, Dall noted that increased population and the discharge of sewage into the bay caused a reduction in the number of species available,

and feared that Monterey would no longer be the conchologist's paradise it had been. More work was done in later years by Harold Heath, working especially on chitons, by the U. S. Bureau of Fisheries Steamer "Albatross" particularly on deepwater forms, by S. S. Berry (1906) and others. The speaker said he had begun his conchological work under the expert tutelage of Dr. Josiah Keep, of Mills College, who for a number of years came to Pacific Grove to deliver a series of talks on conchology to the Chautauqua Assemblies held there annually. In addition, much work on the Nudibranchs has been done by Dr. F. M. MacFarland. Ecological work on Mollusks has been done here by G. E. McGinitie, the area studied being Elkhorn Slough.

Monterey Bay presents a variety of physiographic conditions and ecological habitats which in part account for the abundance of mollusca here. The latter vary from the littoral zone of the open seacoast, to soft shales which provide a habitat for rock-boring mollusks, to open sand beaches, the giant kelp assemblage, and to estuarine conditions. The neritic zone varies from fine dark sand to submarine reefs of dark shale to depths where the sand grades into mud. The Monterey Submarine Canyon is a distinctive and remarkable physiographic feature of the bay with a fauna which is in part peculiar to it. Mr. Smith summarized the mollusk fauna by placing on the board a table which reveals the variety and abundance of forms in Monterey Bay:

Group Valid	Numbers of species and subspecies		
	Record doubtful	Total	for Monterey
Pelecypoda .....	189 .....	22 .....	211
Scaphopoda .....	10 .....	0 .....	10
Pteropoda .....	5 .....	0 .....	5
Opisthobranchiata .....	21 .....	2 .....	23
Nudibranchiata .....	36 .....	0 .....	36
Pulmonata .....	5 .....	0 .....	5
Ctenobranchiata .....	393 .....	44 .....	437
Amphineura .....	51 .....	9 .....	60
Cephalopoda .....	15 .....	1 .....	16
Brachiopoda .....	7 .....	2 .....	9
<hr/> Totals		<hr/> 80	<hr/> 812

This remarkable assemblage probably cannot be matched outside of tropical or semi-tropical areas, and many more forms await discovery and description.

The commercial fisheries of Monterey Bay include the following: The red abalone (*Haliotis rufescens*) which is of greatest importance commercially. Other species are not commercially important. The Chinese started commercial fishing for abalones as early as 1864. Until the beginning of the war the fisheries were dominated by the Japanese. In 1899 the first restrictions were imposed on fishing because of diminishing supply. The license fee was \$60.00. There has been no canning of abalone in recent years. A complete account of the abalone fishery may be found in a paper by Paul Bonnot in *California Fish and Game*. An idea of the commercial importance of the industry may be gathered from the following figures: In 1918 only 3,000 dozen shellfish were taken commercially, 56,000 dozen in 1927, and 46,000 dozen (1,000 tons) in 1928. The rarity of young in late years has been alarming for the future of the abalone in Monterey Bay and elsewhere in California.

Next in importance is the squid fishery, unique in this country. The species is *Loligo opalescens* Berry; this industry was also started by the Chinese who dried the squid on China Point, now the site of the Hopkins Marine Station. The fishing stopped in 1932 because of unstable conditions in China and competition from Japan. The recent pack has all been in Monterey Bay and is mostly for export.

The giant squid (*Dosidicus gigas* d'Orbigny) is important in another way. It has never been possible to make it palatable, but on the other hand it has become a nuisance to the fishermen whose bait it takes. If taken, this squid squirts out a particularly objectionable ink and will also bite the fishermen with its parrot-like beak.

The Octopus fishery involves *O. cf. apollyon* Berry which is perhaps the same thing as *O. hongkongensis*. The octopi are taken in baited traps and the catch averages 75,000 lbs. per year.

**DISCUSSION.**—Dr. van der Schalie pointed out that the fauna of this area afforded an unparalleled opportunity for research which Mr. Smith and his associate were not slow to take up.

#### HELICOID SNAILS OF THE DESERT REGIONS OF CALIFORNIA.

BY WENDELL O. GREGG

The speaker described the distribution and some of the peculiar habits of these snails which belong to four genera, *Helminthoglypta*, *Micrarionta*, *Sonorelix*, and *Sonorella* and include 41 species and subspecies. The detailed discussions of generic and specific characters as well as the account of the distribution of these interesting snails will be published shortly in the Minutes of the Conchological Club of Southern California.

#### COLLECTING IN ECUADOR.

BY JAY G. MARKS

This paper was read by Dr. A. Myra Keen and illustrated by slides. The author describes the physical and climatic conditions along the coastline of Ecuador and the division of the coast into two faunal provinces, the Panamic and the Peruvian which meet in the region of the Gulf of Guayaquil. Here the Guayas River acts as a natural barrier which sharply delimits the two faunal zones. The habitats of the mollusca present many peculiarities which were described in some detail. The species of each faunal assemblage were listed. Of special interest is the burrowing habit of *Litharca lithodomus*, the only species of ark which has such a habitat. It was first noted by Cuming and published by Sowerby in 1833. Cuming's statement that it was found in holes in stones was doubted for many years but confirmed by the author and Don L. Frizzell who both observed its peculiar abode.

**DISCUSSION.**—Dr. Keen remarked that this paper contained many range extensions, both northward and southward. The list of species will be published later. Dr. Henry van der Schalie said that he found the list interesting because of the small number of records in the literature from South America.

#### NOTES ON THE MATING OF SOME ZONITOIDES (VENTRIDENS) SPECIES OF LAND-SNAILS. BY GLENN R. WEBB

This paper is a detailed account of the mating of certain snails of the genus *Zonitoides* (*Ventridens*) illustrated by mounted anatomical preparations and

camera lucida drawings. The mating of caged specimens of *Z. (V.) ligera*, *suppressus*, *intertextus*, and *demissus brittisi?* was observed and dissections of specimens in coitus were mounted. The methods used are those described by the author for polygyrids (Webb, 1947). Courtship was observed and described in *V. ligera*. The dart plays an important part in the process. Following courtship, the mating process of *V. ligera*, and probably of the other three species studied, is effected by a partial implantation of a spermatophore. The implanted spermatophore occupies a shallow wound in the penis of the mate animal and is later conveyed to the interior of the animal's body during retraction of the extruded organs. The form of the exserted parts of the genitalia is basically similar in *V. ligera* (Say) and *V. intertextus* (Binney), but *V. suppressus* (Say) differs chiefly in having the organs less deeply bifurcated. The data are considered to be of value in revealing something of the functional relationships of parts of the sex-organs, and the fact of inter-species spermatophore transfers between some species of *Ventrifidens*.

#### ANNUAL DINNER

At 6:30 in the evening the Annual Dinner was held in the Dining Hall of Asilomar. A special menu had been prepared for the occasion through the good offices of the local committee and was offered to the members of the Union in attendance with the compliments of Mr. Andrew Sorensen, who bore the entire financial cost of the banquet. Since the menu was so unusual and so appropriate to a meeting of malacologists, it seemed worthwhile to give it here in full: Shrimp cocktail, broiled Abalone, crabmeat salad, vegetables, dessert. Mrs. Burch and others of the local committee had prepared corsages of fuchsias for the ladies, which added a festive touch much appreciated by all present.

Dr. van der Schalie voiced the thanks of the guests to the local committee and assured them that their gracious reception and painstaking arrangements were deeply appreciated. Mr. John Q. Burch spoke briefly of the pleasure of the western group at having a meeting on the west coast and being able to exchange ideas and impressions with members of the eastern group. Mr. Sorensen spoke of his pleasure at being able to welcome the Union in Pacific Grove and of the difficulties which had been faced by some of the members coming from the east; one party of these had been held up for a day by snow in the mountain passes and another had encountered such hot weather that their bath water had to be cooled with ice before it could be used for bathing. He urged the West Coast members to their utmost to attend the next meeting which would probably be held in the East. Dr. F. M. MacFarland, the outstanding authority on Nudibranchs, was called upon to speak and said that he hoped that members of the Union would enjoy to the full their visit in Pacific Grove and take the opportunity to see as much as they could of the exceptional fauna of Monterey Bay. Mr. Emery, one of our oldest members in years (84) but one of our youngest in heart, spoke of some unusual collecting experiences of his in Cuba, especially of one occasion when he had to hold on to steep cliffs with both hands and both feet and collect Urocoptids with his mouth. It was a pleasure for many of us who had met Mr. Emery at St. Petersburg in 1935 to renew his acquaintance and to note that the years have not dulled his keen enjoyment and delight in new things. As proof of this, it might be mentioned that he flew out to the Coast and expects to fly back to his home in Florida. Mr. Dranga remarked that he had heard of collecting "by mouth" in Hawaii and that one's mouth is one of the safest places to keep a fragile shell when descending from a tree or cliff. Messrs. Spicer, Kimball, and Arthur Haas also spoke briefly, the latter giving some details

of the Shell Fair held in St. Petersburg last winter. Mr. Emery mentioned that the success of the Shell Fair was due in great part to the efforts of Mr. Haas and that the local conchologists are enthusiastically planning another for next winter.

After the Annual Dinner, the Council met briefly.

### THURSDAY, JUNE 19

The meeting convened at 10 a.m. in the Classroom building of Asilomar. Some especially enthusiastic individuals had taken advantage of the exceptionally low tides now prevailing to go out collecting at 5 o'clock in the morning. The booty was rich and was the subject of admiration and comment by the assembled members.

A short business meeting preceded the scientific sessions. The President read the slate of officers prepared by Council, which is as follows: for President, Dr. Myra Keen; for Vice-President, Dr. Elmer G. Berry; for Secretary, Mrs. Harold R. Robertson; for Treasurer, Mr. Harold R. Robertson; for Councillors, Mr. John Q. Burch, Dr. John Oughton, Dr. Joseph C. Bequaert, and Mr. Allyn G. Smith. Moved by Dr. Spicer, seconded by Mrs. Chace, that nominations be closed; carried. Moved by Mr. Sorensen, seconded by Mr. Aldrich, that the slate prepared by Council be elected unanimously; carried. Moved by Mr. Smith, seconded by Dr. Berry, that the suggestion presented by Council concerning the purchase of a present for our Secretary be approved; carried.

The President gave the gist of the Council's discussion concerning a meeting place for next year and said that a formal invitation had been received from the Carnegie Museum in Pittsburgh. This appreciated invitation was accepted and preparations are now being made to hold the 1948 meeting there.

The acting Secretary read the reports of the Secretary and that of the Treasurer, which were adopted unanimously.

Mr. Sorensen then introduced Mr. Ferdinand Ruth, Science Instructor at Monterey Junior College and said that he had done intensive study of the fauna of the coast for the past three years and was well acquainted with the best collecting places. Mr. Ruth then asked for a show of hands to ascertain the number of those planning to go on the early morning collecting trip Friday; more than twenty hands showed that the trip is a popular feature of this meeting. Mr. Ruth went on to say that the tides will be exceptionally favorable for collecting, as there will be one of the lowest possible tides on this coast on Friday morning. He said that in four years' time the discharge of much sewage into the bay had damaged collecting. The best collecting grounds are now along Seventeen-mile Drive, Carmel, and beyond. The field trip Friday morning would be to Carmel and "Fanshell Beach." The presentation and discussion of scientific papers continued as follows:

### A METHOD OF SEALING VIALS FOR THE PRESERVATION OF MOLLUSCA IN ALCOHOL. BY ALLYN G. SMITH

The permanent preservation of mollusca in alcohol is a problem to anyone who has attempted it; there is much loss of valuable material because the containers used almost invariably allow the alcohol to evaporate after a certain length of time. A technique developed by Dr. G. Dallas Hanna insures a permanent seal of the glass itself which entirely eliminates evaporation. Mr. Smith showed examples of sealed vials of many sizes, up to eight inches long and said that still longer vials may be prepared in the same way. He then outlined the technique of sealing.

Use several different sizes of tubes made of soft glass, not Pyrex. Discarded fluorescent tubes from which the inner coating has been removed have proved excellent. One end of the tube is first sealed flat by heating and pressing down on a plate of soapstone. Next the specimen, the label, and a small amount of alcohol are inserted into the tube. The next step is to soften the glass at a point well above the specimen and draw the tube into an hour-glass shape. Care must be taken not to tip the tube during this operation as the alcohol coming into contact with the hot glass would crack the tube. When the hour-glass shaped tube is quite cold, alcohol is inserted through the almost capillary constriction and the tube is again allowed to dry thoroughly. When the tube is dry, it is cut off and sealed, the seal forming a glass bead at the tip of the cut-off capillary tube. The glass in the region of the seal should be annealed to prevent cracking.

The heating and melting of the glass is done over a special burner called a "Cannonball" which burns air and gas. The process may be carried out to advantage with a number of preparations, carrying each through one step at a time and working at the others while the first preparations are drying. Advantages of the method are the permanent seal which still permits the use of a microscope for examination. For anatomical work the seal must be broken, but once an operator has acquired some dexterity, resealing of a preparation is a matter of no great difficulty.

**DISCUSSION.**—Dr. Myers asked if acetate ink had been used for the labels; Mr. Smith said that India ink had been found quite satisfactory, but that either acetate ink or printer's ink should also be adequate and permanent. Mr. Kimball asked if an acetylene torch could be used in sealing the vials; the speaker replied that it would prove satisfactory if the flame could be made fine enough. The source of air, which must be under three or four pounds pressure, may be a discarded hair dryer, hand bellows, or an aquarium aerating apparatus. Dr. van der Schalie remarked that a Symposium on Preserving methods, similar to the symposium on collecting methods (this *Report and News Bulletin* for 1941) might be in order for future meetings of the Union.

## CALIFORNIA LAND SNAILS AND HOW SOME OF THEM LIVE.

BY E. P. CHACE

The speaker started at the southern end of a large map of California and enumerated the species found in various localities, together with some remarks on their habits and peculiarities. Around San Diego are found the following: *Micrarionta stearnsiana* (Gabb), near Point Loma, under rocks and also in sand; *M. kelletti* (Forbes) on the Channel Islands and one colony on the mainland, possibly introduced from the islands. *Glyptostoma newberryanum* (W. G. Binney) occurs under rocks in San Diego County and also buried in the ground under decaying cacti. It is also found in the mountains back of Pasadena. *Helminthoglypta traski* (Newcomb) and its varieties are found in the southern half of California. It lives in cactus patches but also one colony was found at high tide line and another in sand dunes. *Helminthoglypta tudiculata* (Binney) is found in the southern part of the State and north to Santa Barbara County. It occurs almost anywhere, under logs and in rock piles, in lumber and trash piles, and even in wood rats' nests. The sand dunes near Surf and Morro Bay harbor *Helminthoglypta walkeriana* (Hemphill), a very papillose species. A smooth form is found at San Luis Obispo. *Helminthoglypta umbilicata* (Pilsbry) is also found near San Luis Obispo, in a trickle of water with sycamores; it is abundant under aster bushes at Cayucos. In the Monterey Peninsula are found *Helminthoglypta dupetithouarsi* (Deshayes) in pine woods around Pacific Grove. It requires

moist conditions. With it are found *Vertigo cupressicola* (Sterki) under twigs and pine needles at Cypress Point, which is the type locality for both species. *Helminthoglypta umbilicata* is also found 8 miles up Carmel Valley; *H. dupetithouarsi consors* (Berry) in the San Juan Valley, in stream beds at Felton Grove; *H. exarata* (Pfeiffer) and *H. nickliniana* (Lea) have been recorded for the same place.

Near San Francisco the first *Monadenias* appear on the coast; they are also found in the country back of Fresno. *M. infumata* (Gould) is found from here northward to Scotia. At Cape Mendocino, *M. infumata* gives way to *M. fidelis subcarinata* (Hemphill) which ranges north to Trinidad. From Trinidad northward are found true hybrids between *M. subcarinata* and *M. fidelis*. *M. fidelis* (Gray) makes its first appearance near Crescent City and has a somewhat different cycle of life. In winter no live shells are found or else they are very scarce. In spring they are active but in summer they go up into trees 10 or 11 feet or even 20 feet up, or as far up in the brush as they can go. They are partial to wild cucumber and often aestivate in these or in the brush which the wild cucumber covers. During the fall rains they are active again, but after these they dig into the soil again for the winter. Ground aestivation permits them to escape brush fires. The habit of aerial aestivation is confined to northern California and a small section of Oregon adjoining. At Point St. George, in the rocky, moist habitats with *Mesembryanthemum* and other seashore plants, there is a stunted form of *M. fidelis* which has been called variety *pronotis* (Berry); it digs under plantains. It may be only a depauperate form. Other species of *Monadenia* also have depauperate forms which develop under unfavorable conditions. Lack of time did not permit discussion of the land snails of the interior of California, much to the regret of all present.

### THE MICHIGAN PEARL BUTTON INDUSTRY BY HENRY VAN DER SCHALIE

The Grand River in Michigan has always been one of the largest single sources for pearl buttons in this state. Prior to the war a special survey, as well as reports from clammers, indicated that the mussels in this river were greatly depleted. During the war few people had time to gather shells for commercial purposes. Approximately five years for repopulation resulted in a substantial increase in the fauna. A measure of this recovery was obtained by travelling about sixty-five miles of the river in a John-boat, making sample hauls at forty-five stations on productive mussel producing beds. A discussion of the methods employed for determining yield, as well as some general remarks on the present and future status of the pearl button industry were included in this report which will appear in print later as a contribution of the Michigan Department on Conservation.

### AFTERNOON SESSION

#### A BRIEF REVIEW OF TROPICAL WEST AMERICAN BIVALVES BY L. G. HERTELIN

Bivalves have been used as food by Indians since before the beginning of written history. The pearl oyster industry was once important on this coast, though not of late years. Incidentally, a method of artificial cultivation was developed by Gaston J. Vives, a Mexican, in the early part of this century but commercial projects based upon his work were ended in 1914 by events connected with the revolution in Mexico.

The area discussed extends over more than 2,000 miles of tropical waters from Cedros Island (approximately Lat. 28° N.) and the head of the Gulf of California (approximately 31° 31' N.) to Punta Aguja, Peru (Lat. 5° 57' S.). In this area various habitats are present: open ocean, sheltered bays, sandy beaches and rocky headlands along the coast and various depths, all of which are conducive to the development of a varied and numerous pelecypod fauna. The average temperature at Cedros Island is approximately 63°—64°F. or slightly higher. The information presented is derived from first hand observation, cataloguing of the literature and straightening of the synonymy.

The numbers cited in the following categories are entirely provisional and not to be regarded as final. However, while some of the species here regarded as valid ultimately may be relegated to synonymy, other species will be described or recognized so that it is believed that the numbers furnish a useful approximate basis for further studies of the bivalve fauna of this region. 838 pelecypods are known in this region, but of these 198 are known only from the type locality. Cedros Island is the limit for many species which range to the north and of others which range to the south respectively. The number of forms occurring in southern California which range south of Cedros Island is 128; of these 40 do not range beyond Cape San Lucas, 88 range past Cape San Lucas and 50 range south to Panama. Species occurring only between Cedros Island and the Gulf of California, 83; species recorded from the Gulf of California, 415; species occurring between Cedros Island and the Gulf of California which range south to Panama, 246; species recorded only from Panama, 85; species occurring in Ecuador or northern Peru not ranging north of Panama, 32; species from Ecuador or Peru ranging south of Punta Aguja, Peru, about 35—40; species recorded from both the eastern Pacific and the Caribbean region number 18 or 2.15 per cent of the total fauna. Certain superfamilies and genera are well represented in number of species, for example, Veneracea 98, Tellinidae 91, Nuculanidae 58, Arcidae 41, *Semele* 35, Mactridae 20. Nearly two dozen species of the family Cyrenidae have been recorded from this region of which 16 have definite west American type localities.

Compared with other regions, Dall recorded 496 pelecypods and 1,424 gastropods (excluding the order Nudibranchiata) occurring between Bering Sea and San Diego, California. Faustino recorded 1,030 pelecypods and 3,082 gastropods from the Philippine Islands. Johnson recorded 730 pelecypods and 1,724 gastropods from the region between Labrador and Texas. The general ratio of pelecypods to gastropods is usually about 1 to 3.

In Miocene time, one or more seaways permitted species to migrate between the Pacific and Caribbean regions. Olsson has stated that about 17 per cent of the species recorded from the Miocene of Peru occur in Caribbean deposits or have related forms in those beds. To what extent deep water mollusks migrated between the two areas is not known at present. The latest interoceanic connection between the Pacific and Caribbean is believed to have existed in lower or middle Miocene, perhaps 12—18 million years ago.

**DISCUSSION.**—Mr. Allyn G. Smith said that on checking with the pelecypod fauna of Monterey Bay, he found that the same ratio of one to three existed there between the pelecypods and the gastropods. Dr. van der Schalie asked if there was any geological reason to account for the sharp change in fauna at Cedros Island. Dr. Hertlein replied that so far as he knew no geological agents were involved and that the striking change could be ascribed only to temperature differences. A great deal of work which has been done on Japanese oysters which did not reproduce on the West Coast has shown that temperature conditions

are very important in this connection. Dr. Spicer asked if deepwater species were as widely distributed in latitude as the shallow water ones or whether they were limited in their range. Dr. Hertlein replied that most of the deepwater species are rather widely distributed but that much more dredging must be done before categorical statements can be made with reference to such distribution for west American mollusks. Mr. Sorensen remarked that *Pitar lupanaria* of the West Coast is very similar to *P. dione* of the West Indies and Texas, but that great differences exist between the gastropods. He also asked if Dr. Hertlein could give any reason why *Haliotis* stopped in its southward advance at Cape San Lucas. Dr. Hertlein replied that so far as he knew no reason for such distribution had been advanced other than that of temperature. (An exception to this distribution along the west American coast is that of *Haliotis dalli* Henderson originally described from about 33 fathoms near Charles Island, Galapagos Islands.—L. G. H.)

#### ABNORMAL SHELLS OF SOME PACIFIC MARINE MOLLUSKS

BY DR. HOWARD R. HILL, CURATOR OF ZOOLOGY, LOS ANGELES MUSEUM.

Mollusks have normal and abnormal variations. Among normal variations, the following are frequently observed:—1. Variation in color as seen in the Philippine species—*Nerita polita*, *Neritina communis*, and *Oliva funebralis*. 2. Variation in size influenced by environment and extreme age. 3. Variation in structure affected by habitat. Heavy shells develop in areas exposed to heavy wave action. Thin smooth shells are found in protected areas. 4. External appearance changed by ornamentation of shell by foreign organisms, such as corals, hydroids, sponges, bryozoans, etc. Many varietal names have been given to normal variations.

Abnormal variations are of many types and the cause of variation cannot be explained in all instances. Among the most common shell modifications that have been observed in univalves are: 1. A wide separation of the whorls. 2. Shortening of the aperture. 3. Excessive number or elongation of spines, excessive number of nodules, ribs, and teeth in the aperture. 4. Development of a keel around the aperture. 5. Deformation of the body whorl. 6. Development of the aperture on the wrong side. 7. Reduction or increase of number of valves in Chitons. 8. Absence of dorsal perforations in abalones.

In bivalves, there has been noted: 1. Elimination of spines through erosion. 2. One valve much smaller than the other. 3. Imitation by oysters of the color and structure of the shells to which they are attached.

Most mollusks are able to repair or mend broken or damaged shells and to guard against injury or irritation from foreign objects or boring organisms. The method is by replacement of shell linings or the secretion of protective barriers. The result is frequently an abnormal shell with a consequent irregular shape, loss of color, and development of pearls, blister pearls, or additional shell layers.

The exhibit accompanying this paper demonstrated many of the variations mentioned, including a pearl fish covered by a layer of mother-of-pearl inside of a valve of the West Mexican pearl oyster, *Pinctada mazatlanica*.

DISCUSSION.—Mr. Dranga remarked that he had seen three dextral *Busycon perversum*, which is normally sinistral, and that may sinistral specimens of *Marginella apicina* had been collected by him. Mr. E. P. Chace noted that he had seen three specimens of *Fissurella volcano* in two of which the aperture was entirely plugged; in the other it had been reduced to a mere pinhole. He had also seen *Diodora aspera* in which the aperture had been closed by algae. Mr.

Richard W. Foster said that the Museum of Comparative Zoology at Harvard had a peculiar specimen of *Mya arenaria* which had a tubular plication of the shell which no one had yet satisfactorily explained; another specimen of the same species had a flat right valve. Dr. Henry van der Schalie said that in working with *Potamopyrgus coronatus* from Puerto Rico, he had found that specimens from brackish water were much more spiny than those from fresh water. Work on *Hydrobia jenkinsi* (Smith) by Warwick (1944) had shown that the spinose condition was initiated by the presence of an alga and that it appeared in such a manner as to show that the presence of spines had no genetic significance.

#### THE PREPARATION OF A BIBLIOGRAPHY OF THE LITERATURE ON MOLLUSK BIOLOGY. BY RICHARD W. FOSTER

This paper described a project being launched at Harvard to compile a complete bibliography on molluscan biology by means of a systematic search of the literature, beginning first with the technical journals in the field of Mollusca, then covering areal reports, checks lists, etc., in an effort to get the title of every paper that has been published. Methods of filing bibliographic cards and of indexing them were also discussed. The project is expected to require several years, and it is hoped eventually that the data may be published.

**DISCUSSION.**—Capt. Arthur Haas asked two questions: 1. There is duplication and conflict in the untold number of papers published on Mollusca. Has any attempt been made to trace the most authoritative paper for the guidance of the malacologist? 2. Is there any modern encyclopedia or compendium which is authoritative enough to permit positive identification of Mollusca? Mr. Foster answered both questions in the negative, saying that our science was still in the formative stage and that it would be many years before such compilations could be prepared.

Dr. Spicer remarked that the late Dr. Fred Baker had prepared a scholarly index to the literature of Mollusca which was probably still in existence and would be extremely useful to the Harvard group in the preparation of their bibliography. Miss Bristol said that not only was Dr. Baker's index available but that Dr. Joshua Baily had been keeping it up to date and that it could probably be made available to Harvard for the preparation of their bibliography.

Dr. Earl H. Myers called attention to the excellent compilation of original descriptions and figures of Foraminifera by Ellis and Messina and thought that a similar compilation on Mollusca would be very useful.

Dr. van der Schalie said that the Michigan group were working on an index to the *Nautilus* for volumes 35 to 60 inclusive, similar to the one already issued for the first 34 volumes. Also, that most workers in malacology lack opportunity to see new publications as they appear. When Dr. Fritz Haas was editor of the *Archiv für Molluskenkunde* he used to publish short reviews of new publications as they appeared. A series of reviews of the same nature might well be published either in the *Nautilus* or in the *Minutes of the Conchological Club of Southern California*.

#### DREDGING ON THE MENDOCINO COUNTY COAST BY G. DALLAS HANNA

This paper, read by Mr. Allyn G. Smith, is a diary of a cruise aboard the *N. B. Scofield*, the exploration vessel of the California Division of Fish and Game, from July 23 to August 6, 1940. The diary sets forth the usual ups and downs of dredging, including the loss of much gear through fouling on the bottom or

breakage of towing lines, and the enthusiasm of the collector when a rich haul is brought in. The results of the dredging include the extension of the range of a few species, and the capture of a number of others only taken from deep water.

DISCUSSION.—Mr. E. P. Chace remarked that Mr. Strong and his associates had made several successful hauls with a dredge belonging to him (Mr. Chace).

The meeting adjourned at 4:30 p.m.

## EVENING SESSION

### ILLUSTRATED ADDRESS BY DR. RALPH BOLIN, ASSISTANT DIRECTOR, HOPKINS MARINE STATION

The speaker was introduced by Mr. Sorensen who said that we were fortunate to have obtained Dr. Bolin's consent to address us at this time because he was an eminent lecturer and teacher whose ability to interest his audiences had caused him to be much in demand; in addition, Dr. Bolin's only daughter was being married in a few days and this made further inroads into his available time.

Dr. Bolin said that he hoped members of the Union would visit the Hopkins Marine Station and see some of the animals which he was about to show us on the screen. The film we were to see was concerned mainly with organisms other than mollusks but he promised that there would be some of our pet subjects as well, and that he would chat to us about the pictures as they appeared on the screen.

Mr. Sorensen's promise of something very special in the way of addresses was more than fulfilled when the film was shown. Starfish, brittle stars, sea anemones, ghost crabs, hermit crabs, sea urchins, sand dollars, worms, nudibranchs, and other mollusks appeared on the screen in the full glory of the color of the living animal, so different from the dried or preserved specimens most of us are accustomed to see. Especially notable were *Cardium nuttallii*, moon shells and their "sand collars," *Nassarius fossatus*, and *Siliqua patula*. Dr. Bolin's remarks were timed to perfection for the appearance of each new animal and provided a wealth of information about each one. The nudibranchs were a revelation to those of us who had never seen them alive and fully expanded.

The talk aroused much discussion. Mr. Dranga asked for information on the breaking off and regrowth of claws in crabs. Dr. Bolin answered that it was indeed true that crabs will grow new claws after they have been broken off and that they will even break off claws themselves. The new claws are fully grown after two molts; he explained that molting in stone crabs is frequent in early life, sometimes as many as one every two or three days, but that later molts are more widely spaced. Full grown crabs molt every year or only every second or third year.

Mr. Chace remarked that he had seen half-grown claws on crabs and asked if crabs stored up lime prior to molting. Dr. Bolin agreed that lime must be stored up in the tissues of the crab before molting and said that it is laid down very quickly after the old shell is shed. Crabs are important as scavengers wherever they are found.

In answer to another question, Dr. Bolin said that sea urchin roe is eaten by a small number of people who have learned to appreciate this delicacy. He himself had tried it and found it very good. Sea urchins are not protected by law in California. They are an important experimental animal in embryology because the egg is remarkably resistant to all sorts of laboratory treatment. Dr. Spicer said that he had bought Japanese canned sea urchin roe in Hawaii and Mr. Dranga added that in Hawaii it is always served with poi.

There was also some discussion of moray eels which Dr. Bolin said were not commonly found north of Point Conception, and of the eating of live mollusca. Mr. Foster asked if Dr. Bolin had heard of anyone eating live *Octopus*. The speaker said he had not, but that some fishermen eat gastropods alive. Mr. Dranga remarked that *Octopus* was very good eating but that he had not tried to eat them alive himself.

Dr. van der Schalie expressed the feelings of the meeting when he thanked Dr. Bolin for his fine address, as witness the standing vote of thanks and the enthusiastic applause which accompanied it.

### FRIDAY, JUNE 20

The day began early for most of us with a 5 a.m. shore collecting trip led by Mr. Ferdinand Ruth, Science Instructor at Monterey Junior College, whose intimate knowledge of the collecting grounds of the Monterey Bay area assured an abundant and choice catch even for those who had not done any marine collecting before. This was the first of two scheduled collecting trips in the area. The first was led by Mr. Ruth, the second by Dr. Earl H. Myers. The collecting was exceptionally good since the time of the meetings was specially arranged to take advantage of the unusually low tides (-1.9 and -2.0) that occurred June 20 and 21.

The mollusks gathered were a tide pool assemblage with a wide variety of shell-bearing gastropods, numerous Chitons, and some unusually beautiful Nudibranchs. The rocks in the pools were covered with a thick growth of marine vegetation so that in many instances the animals found better quarters on the under sides of the stone. The use of a crow bar for turning large boulders proved handy for getting at the species that were thus hidden. Many of us spent the time between the return from the collecting trip and the beginning of the morning session cleaning our catch. Among some of the groups that demanded immediate attention, the Chitons were of special interest. After tying the specimen on to a glass slide or against a small piece of wood, these animals were killed in a relaxed position by immersion for thirty or sixty seconds in warm fresh water. They were then removed from the objects to which they were tied to prevent curling and placed directly into the alcohol preservative. One ingenious soul found that the Asilomar key label provided a good substitute for this purpose and others followed suit so that there was no mistaking the owner of an A. M. U. key. The Nudibranchs were unusually beautiful and it was disconcerting that the colors could not be kept in preservatives.

The scientific session opened at 10 a.m., continuing with the presentation of papers as follows:

### PROTOZOANS AND FORAMINIFERA BY DR. EARL H. MYERS

Foraminifera are interesting to malacologists in that they have tests which resemble the shells of cephalopods; so much that they were once thought to be Mollusca. They are now known to be Protozoa; like other Rhizopoda, they have pseudopia which are capable of extrusion and retraction, and feed on microscopic organisms. The test is often calcareous and thus readily preserved in geological deposits. The Foraminifera have been abundant since the Pennsylvanian and their tests provide good index fossils which are of great importance in oil stratigraphy. On the other hand Foraminifera are known to have existed in the pre-Cambrian. An interesting sidelight is that the Pyramids of Egypt are built of nummulitic limestone, so named because of the abundance of foraminiferal tests

in the limestone. In present day seas, great expanses of ocean floor are covered with Globigerina ooze, that is, ooze containing 50 per cent or more of its volume of tests of Foraminifera.

The life cycle involves two types of individuals, the megalosphaeric and micro-sphaeric stages. The former is uninuclear and the latter polynuclear. Test dimorphism in the Foraminifera is due to an alternation of generations of these two stages. The life cycle is complex and varies from one species to another. In some species the cycle is completed in 42 days while in others two years or more are required.

Factors influencing the growth of Protozoa in the sea are maximum hours of sunlight, increase in temperature in the sea, salinity (which may be reduced by rains), nutrient salt content, and abundance of phytoplankton and zooplankton. Foraminifera are especially affected by variations in the abundance of food organisms mainly microplants. The influence of temperature has been overstressed although it plays an important role. The important factors are the amount of food available and the nature of the substratum.

DISCUSSION.—Mr. H. W. Harry asked if the small, apparently juvenile forms contained in the Globigerina ooze, which had formerly been listed as unidentifiable, had been tied in with the identified forms. Dr. Myers said that this had not been worked out as yet. Mr. Webb asked if the Foraminifera had been found suitable for genetic study. Dr. Myers replied that le Calvez and Myers had described mitosis in the Foraminifera but that no genetic studies had been made. Dr. van der Schalie said he was interested in the taxonomic problems and complexity of oceanographic conditions which reminded him of limnological problems. Dr. Myers remarked that in the sea as in deep lakes, there is a definite thermocline which limits the vertical distribution of food organisms in the water.

A COMPARATIVE STUDY BETWEEN MEMBERS OF THE GENERA  
POMATIOPSIS AND ONCOMELANIA  
BY E. G. BERRY

The speaker, who is now with the Division of Tropical Diseases, National Institute of Health, Bethesda, Maryland, illustrated his talk with photographs and specimens and dissections. A comparative study of members of the genus *Pomatiopsis* with those of the Oriental genus *Oncomelania* indicates a close relationship and they should probably be placed in a common family. Both members of these genera are amphibious and are found in similar habitats. They do not glide over the substratum as do most snails, but move the anterior part of the foot forward, attach that part to the substratum and move the posterior portion forward. Both have a deep groove on the lateral side of the foot located posteriorly to the rostrum. Radulae of both genera bear similar formulae; examples:

	Central	Lateral
<i>Oncomelania hupensis</i>	1-1-1 : 2-2	2-1-3
<i>Pomatiopsis lapidaria</i>	1-1-1 : 2-2	2-1-3
<i>Oncomelania quadrasi</i>	2-1-2 : 2-2	2-1-3
<i>Pomatiopsis binneyi</i>	2-1-2 : 2-2	2-1-3

The male genital organ, the verge, is simple with a single convolution and is exserted on the posterior portion of the neck. It is usually hidden by the mantle. Eggs are similar in size and covered with a protective sand-husk.

**DISCUSSION.**—In answer to a question from Mr. H. W. Harry, Dr. Berry said that *Pomatiopsis* came out of the water several feet to breed; the eggs are encased in sand. Mr. Chace remarked that he had collected *Pomatiopsis* at Crescent City. The first ones were found in late June at the edge of the water and later near a road under willows in a spot which was wet in winter but dry in summer. The snails were half buried in almost dry mud. Mrs. Chace offered some corrections of locality data and remarked that the type locality of some species described from California had been destroyed. Mr. A. La Rocque said that the data given by Mr. and Mrs. Chace emphasized the importance of the local collector to the field of malacology. Dr. Berry said that in his work he had received much assistance from both museums and collectors. Mr. Chace remarked that the time element is important in successful collecting. If there is no local data the collector will miss half of the species available by collecting at the wrong time. Dr. Berry thanked individual members of the A. M. U. for sending in specimens and for other courtesies.

#### REMARKS ON CHECKLISTS BY L. G. HERTLEIN

A discussion of checklists and some of the problems encountered during their compilation was given. Special reference was made to the utility of the checklists of Dall, 1921, and of Johnson, 1935. A checklist brief but containing the maximum information was suggested. The general procedure followed by Dall, 1921, with certain additions, was recommended. This would furnish ready references as well as basic information for further research. Additions suggested were: citation in the synonymy of the name under which the species was originally described, citation of at least one modern reference to an illustration (when available), type locality, a list of the synonyms (if any) with their original date of publication. A list of species recorded as occurring in the area covered by the checklist but which are not considered as representing valid records and a complete index with cross reference to the genera, subgenera, species and subspecies should be included.

**DISCUSSION.**—Mr. Chace remarked that geographic names in old records are often hard to locate on modern maps and gave some instances of unsolved puzzles in localities in California. Mr. A. La Rocque noted that one of the most difficult problems faced by the compiler of checklists is provision for expansion. Publication of a list acts as a stimulus to collectors and in a few years so much new data have been accumulated that the checklist must be amended and added to. Mrs. Chace said that most workers accepted checklists as stepping stones to further accomplishments and as a challenge for further efforts.

#### AFTERNOON SESSION

The meeting opened at 1 p. m. The presentation and discussion of scientific papers continued with the following:

MOLLUSKS INTRODUCED INTO THE PACIFIC COAST THROUGH THE  
IMPORTATION OF SEED OYSTERS FROM JAPAN  
BY PROFESSOR TREVOR KINCAID

In the absence of the author, this paper was read by John Q. Burch; it was accompanied by an exhibit of specimens. The mollusks introduced on the Pacific Coast from Japan with seed oysters include some species of economic value, others which are highly detrimental to the native fauna and others which are neither harmful nor valuable. Introduction of species leads to a consideration of the conditions which govern successful introduction; physical conditions must be suitable, acceptable food must be available, enemies must be absent or of limited importance. The first attempt at introduction of oysters on the Pacific Coast was a failure. The Atlantic Oyster was introduced at Puget Sound and Willapa Bay but did not survive. Other species, introduced at the same time but not intentionally, managed to establish themselves. These are *Mya arenaria* which is now found from California to Alaska, *Crepidula fornicata*, *Urosalpinx cinerea*, *Petricola pholadiformis*, and *Nassarius mendica*.

The Japanese Oyster, *O. gigas*, or more properly *O. laperousei* Schrenck, was introduced near Bellingham, Washington and with it were unintentionally brought the following species: *Tritonalia japonica* Dunk., *Lampania zonale*, *Paphia philippinarum*, *Trapezium japonicum*, *Turbo marmoratus*, *T. coronatus coreensis*, *Monodonta labio*, *Thais* sp. cf. *T. tumulosus* or *nodulosa* var. *problematica*, *Acmaea heroldi* var. *signata*, *Modiolus senhae*, and *Pododesmus* sp.

DISCUSSION.—Mr. Allyn G. Smith observed that *Tapes philippinarum* is found in San Francisco Bay; the law protecting clams applies only to *T. staminea*, the native species, which here does not intergrade with *T. philippinarum*. This situation has caused embarrassment to the authorities who were powerless to enforce the law against a collector who took only *T. philippinarum*. *Volsella senhae* is also found in San Francisco Bay where there are many additional introductions. *Corbicula fluminea* is very abundant in some places. Mr. Sorensen said he had hoped that Mr. Tolman, owner of the oyster beds at Morro Bay, could be present at the meeting. Mr. Tolman has found that his main trouble came from *Murex festivus*, a native species. Mr. Dranga asked if *Achatina fulica* had been introduced anywhere along the California coast. It is a very dangerous species and any occurrence should be reported. It had become a pest in many of the islands of the East Indies and also in Hawaii. Mr. Chace said he had taken both *Crepidula fornicata* and *C. plana* in places where Atlantic oysters had been planted. The oysters had not survived but the slipper shells had. Mr. Sorensen observed that when Nature is disturbed the consequences are unpredictable. Long ago the Chinese grape pickers brought over *Viviparus malleatus* from China for food. The species is now found at many places in North America. Dr. van der Schalie closed the discussion, observing that the machinery for prevention is costly and that it has been usually impossible to set it in motion until it was too late.

EXHIBIT OF RARE SHELLS RECEIVED AT STANFORD UNIVERSITY  
DURING THE WAR. BY DR. A. MYRA KEEN

This was an informal talk on four collections remarkable either for the rarity of the species or the unusual localities from which they had been collected. The war had brought American soldiers and sailors to many far places not usually visited by collectors; friends of Stanford had sent back many interesting lots of shells. She showed specimens from Ecuador, collected by Jay Marks and arranged according to habitats; a collection from Panama Bay, assembled by Walter Clark

and containing material that looks very like the Miocene Gatun fauna but is in reality Recent. This collection includes *Pholadidea melanura* and a species of *Crassispira* that is probably new. Dr. H. G. Schenck and servicemen under his supervision had sent 75 pounds of material from Oro Bay, in New Guinea, which included *Cardilia* and specimens of the geno-type of *Angulus*; this collection has affinities both with the Philippines and with northern Australia. Another fine lot collected by Jack Dowdle was the last of this interesting series.

### EXHIBIT OF WORLD *Haliotis* BY A. SORENSEN

The speaker, whose interest in Abalones has led him to gather together a collection including most of the species of *Haliotis* found in the world, showed a part of his collection and commented on the genus generally and the California species in particular. Members of the genus *Haliotis* are variously known as abalones, ear shells, ormers, and mutton-fish. California law recognizes four species but at least eight are known to science. Mr. Sorensen outlined the differences between each of the species and pointed out the characters discussed on actual specimens.

California law draws a sharp distinction between the individual fisherman, the commercial fisherman, and the collector. The individual is permitted to take as many as ten abalones a day, from seven inches in length up, and he may hunt for them anywhere along the beaches or in deeper water; the commercial fisherman, on the other hand, must not take abalones in water less than 20 feet deep nor must he take specimens less than eight inches in length. The collector is allowed to take specimens of any size for scientific purposes but must use discretion in doing so.

Mr. Sorensen spoke briefly of the *Haliotis* found in other parts of the world; these peculiar gastropods are found in the Bay of Biscay and along the British coast, Japan, South Africa, Australia, and New Zealand. The shells take a beautiful polish and are used for lampshades and various ornamental purposes. Blister pearls are quite common on the inside of the shell and are the animal's defense against the borings of Pholads.

The meeting adjourned early in order to permit members to make a scheduled visit to the Pacific Grove Museum where they were received and shown around by the Curator, Mrs. Theresa Lloyd. The Museum is in the heart of Pacific Grove and surrounded by a garden in which typical California plants of many species are grown; the labels proved of great interest to visitors from the East who had a splendid opportunity to learn the names of many flowers and bushes which they had observed but not identified.

The Pacific Grove Museum is notable for the spotless order in which it is kept through the tireless efforts of Mrs. Lloyd and her assistants. It contains fine exhibits of the fauna and flora of Monterey Bay and the vicinity, well arranged for the convenience of the public. It also houses many historical treasures of pioneer days in California. Its coin collection attracts a great deal of attention from visitors. The weapon room contains a collection of Tibetan weapons presented by Mrs. Herbert Hoover. The Museum serves as an information center for naturalists of the Pacific Grove region and works hand in hand with the Hopkins Marine Station not far away. Mrs. Lloyd is to be congratulated on her curatorship of this fine Museum, a tribute to her energy and devotion.

Dinner this evening deserves special mention. As dessert was being served, the chef and his staff in full regalia made their appearance carrying a huge birth-

day cake with more candles than your secretary was able to count. The cake marked the birthday of John Q. Burch and also honored Mrs. Theano W. Case, of San Diego, California, the undisputed dean of the meeting, 95 years old and still collecting with the youngest of us. Mrs. Case is a graduate of Oberlin College, Ohio (class of '72) and has made her home in California for many years; she is known as an enthusiastic collector of marine algae.

Another surprise for the meeting was the distribution of live specimens of two species of *Calliostoma* which had just been collected on the kelp in Monterey Bay. Special boxes of these were presented to Mr. Dan L. Emery and Mr. W. J. Bower of St. Petersburg, Florida, as a token of appreciation for the Florida shells they had brought as gifts for members in attendance.

The evening session was devoted to the Presidential Address, a brief abstract of which follows. The full text is not given here as Dr. van der Schalie's paper is soon to be published elsewhere.

## THE LAND AND FRESH-WATER MOLLUSKS OF PUERTO RICO BY HENRY VAN DER SCHALIE

At present there are approximately one hundred and fourteen species of land shells and about twenty fresh-water species inhabiting Puerto Rico. Although the fauna is not as rich, nor as strikingly endemic as that of Cuba, there are many opportunities for study of this relatively rich mollusk fauna. All of the reported species have been listed and some information bearing on ecology and distribution is included. Detailed information on the mollusks of this island when considered with similar information about the fauna of neighboring islands, may aid considerably in solutions of zoogeographical problems.

The programme continued with two more rolls of color film from the Hopkins Marine Station shown by Mr. Ferdinand Ruth who commented on each scene. The animals shown were the same as those seen the previous evening, but these two rolls were completely different shots.

Mr. John Strohbeen showed five Kodachromes of a fish washed ashore at Rio del Mar, California, which no one had so far succeeded in identifying. Mrs. Burch announced that registration had reached 73 and urged those members who had not yet registered to do so before the close of the meeting. The meeting continued with informal discussion long after the official adjournment.

### SATURDAY, JUNE 21

At 5:30 a.m. another party of insatiable collectors under the leadership of Mr. Ruth, raided the rocks exposed at low tide in Monterey Bay and returned loaded down with much booty.

During the morning members of the Union in attendance were shown the famous Seventeen-Mile Drive and Point Lobos Reserve State Park where they were able to observe the two species of seals and sea lions on the rocks off the coast as well as a great number of sea birds, including cormorants and pelicans. Time did not permit us to walk as much as we should have liked to along the trails in the Point Lobos Park, nor to visit Carmel Mission, but most of us made a mental note to return to these places later and enjoy them at leisure. The tour was sponsored by the Pacific Grove Chamber of Commerce who are to be congratulated on the efficiency of their arrangements.

In the afternoon, a large party of members visited the Hopkins Marine Station, where they were shown around the laboratories. Here they had an opportunity to see some of the organisms which they had admired in the color films shown

previously. A highlight of the visit was to find Dr. F. M. MacFarland at work in his laboratory and to chat with him about his favorite mollusks, the Nudibranchs, of which he had a number under observation, alive in salt water tanks.

The dinner this evening might be described as a closing dinner. The Florida group had prepared a surprise for us. Mr. Dan L. Emery read a poem by Miss Edna Haas which so exactly expressed the feelings of all easterners that it deserves to be reproduced herewith:

#### LINES ON THE MALACOLOGICAL CONVENTION 1947

'Twas in the latter half of June  
There came from East and West  
Malacologists of great renown  
And others not so blessed.  
They convened in Pacific Grove  
A Mecca for shells rare,  
To listen to shell sagas  
And in gathering shells to share.  
Our hosts with gifts us showered  
Told us where to eat and sleep  
We scarce could find words to express  
Our gratitude so deep.  
We hied us soon to lecture rooms  
And learned papers heard

Though some of us (a trifle deaf)  
Missed every other word.  
The Banquet was a wondrous meal  
With "Abalone" steak  
And two days later, we all shared  
John Burch's Birthday cake.  
Our field trips started at the dawn  
And though we nearly froze  
We came back with a lot of loot  
Which we hope won't decompose.  
Though the Convention's o'er for us  
We feel it's not the end  
For we will keep in contact close  
With many a new found friend.

— Edna Haas

Mr. Sorensen, responding to the Florida group, said that the Pacific Coast group felt highly honored that the A. M. U. should hold its Thirteenth Annual Meeting in Pacific Grove. It was the first Pacific Coast meeting in fourteen years and the second since the close of the war, hence he felt doubly honored and hoped it would be possible for the Union to come to the Pacific Coast again soon.

Dr. van der Schalie, on behalf of the Union, said that we were all grateful to Mr. Sorensen, the Burches, Mrs. Whelchel, and others of the local committee who helped to make this meeting one of the best in the Union's history.

The meeting was now officially closed, but most of the members adjourned to the recreation hall of Asilomar to continue informal talk. One party started a game of billiards and soon had an interested group of kibitzers. Others gathered in a circle of chairs and again the talk continued far into the night. It was not until the next morning, Sunday June 22, that the last A. M. U. members left Asilomar to scatter to all points of the compass until another meeting brings them together again next year.

Respectfully submitted

Aurèle La Rocque  
Acting Secretary

## MEMBERS AND VISITORS IN ATTENDANCE

Mr. F. R. Aldrich, Balboa, Cal.  
Dr. Elmer G. Berry, Bethesda, Md.  
Dr. L. R. Blinks, Pacific Grove, Cal.  
Dr. Ralph Bolin, Pacific Grove, Cal.  
Mr. and Mrs. Ralph Bormann, Long Beach, Cal.  
Mr. William J. Bower, St. Petersburg, Fla.  
Miss Viola S. Bristol, San Diego, Cal.  
Mr. and Mrs. John Q. Burch, Los Angeles, Cal.  
Mrs. Theano W. Case, San Diego, Cal.  
Mr. and Mrs. E. P. Chace, Lomita, Cal.  
Mr. and Mrs. Paul Chenoweth, San Francisco, Cal.  
Mrs. Effie M. Clark, Los Angeles, Cal.  
Miss Ruth E. Coats, Tillamook, Ore.  
Mrs. Lynn W. Conlan, Carmel Valley, Cal.  
Mr. Ted Dranga, Miami, Fla.  
Mr. and Mrs. H. Arden Edwards, Alhambra, Cal.  
Mr. D. L. Emery, St. Petersburg, Fla.  
Miss Alice R. Everett, Santa Cruz, Cal.  
Mr. Richard W. Foster, Cambridge, Mass.  
Mr. Ralph O. Fox, Berkeley, Cal.  
Miss M. R. Glen, Pacific Grove, Cal.  
Dr. Wendell O. Gregg, Los Angeles, Cal.  
Capt. Arthur Haas, St. Petersburg, Fla.  
Miss Edna Haas, St. Petersburg, Fla.  
Miss Ruth Hacking, Santa Cruz, Cal.  
Mr. George L. Harrington, Palo Alto, Cal.  
Mr. Harold W. Harry, Shreveport, La.  
Mr. and Mrs. Carl Hegner, Los Angeles, Cal.  
Dr. L. G. Hertlein, San Francisco, Cal.  
Dr. and Mrs. Howard R. Hill, Los Angeles, Cal.  
Dr. A. Myra Keen, Stanford University, Cal.  
Mrs. E. B. Keen, Stanford University, Cal.  
Capt. S. L. Kimball, Weaverville, Cal.  
Mr. and Mrs. M. H. Knowles, Pacific Grove, Cal.  
Mr. and Mrs. Aurèle La Rocque, Ann Arbor, Mich.  
Miss Kay Lawlor, Carmel, Cal.  
Dr. and Mrs. F. M. MacFarland, Palo Alto, Cal.  
Dr. and Mrs. Earl H. Myers, Pacific Grove, Cal.  
Mr. David Nicol, Stanford University, Cal.  
Mr. Bruce Parker, Hollywood, Cal.  
Miss Joyann Paul, Pacific Grove, Cal.  
Mrs. M. L. Russell, Carmel, Cal.  
Mr. Ferdinand Ruth, Monterey, Cal.  
Mr. Herb Schlanger, Los Angeles, Cal.  
Mr. Eugene H. Schmeck, Niagara Falls, N. Y.  
Mrs. Clarice Seldomridge, Omaha, Nebr.  
Miss Miriam Shepard, Portland, Ore.  
Miss Agnes J. Shumate, Santa Monica, Cal.  
Miss Lotus Simon, Portland Ore.  
Mr. Allyn G. Smith, Berkeley, Cal.  
Mr. Andrew Sorensen, Pacific Grove, Cal.

Dr. and Mrs. V. D. P. Spicer, Centralia, Wash.  
Miss Myrle A. Sprague, Pasadena and Pacific Grove, Cal.  
Mr. and Mrs. John P. Strohbeen, Santa Cruz, Cal.  
Miss R. A. Sylvester, Pacific Grove, Cal.  
Mr. D. Dwight Taylor, Altadena, Cal.  
Mr. Dwight W. Taylor, Altadena, Cal.  
Mrs. Margaret Teskey, Buffalo, N. Y.  
Mr. and Mrs. H. R. Turver, South Gate, Cal.  
Dr. and Mrs. Henry van der Schalie, Ann Arbor, Mich.  
Master Arnold van der Schalie, Ann Arbor, Mich.  
Mr. and Mrs. M. L. Walton, Glendale, Cal.  
Mr. Glenn R. Webb, Ohio P. O., Ill.  
Mr. H. E. Wescott, Guam, M. I.  
Mrs. A. T. Whelchel, Fresno, Cal.  
Mr. Ernest N. Wilcox, San Luis Obispo, Cal.  
Miss Lucia Wiley, Portland, Ore.  
Mrs. Nellie C. Williams, Omaha, Nebr.  
Mr. and Mrs. Charles R. Wright, Sanger, Cal.

## SHALL WE HAVE A WEST COAST BRANCH?

The following letter was sent to Council members by the President who will be glad to have opinions from the membership as well. Extracts from replies to date are given below and steps being taken in accordance therewith.

Box 1563  
Stanford, California  
August 13, 1947

To all members of the A. M. U. Council:

As you probably all have heard by now, the meeting of the A. M. U. at Pacific Grove last June was exceptionally well attended—86 members and visitors registered. Most of these persons were from the western states. Hence, the suggestion has been made that perhaps the western group has reached a size such as to justify organization of a separate section without detriment to the parent society and with the advantage of giving these enthusiasts an opportunity to meet annually. The United States is so large that members in the East rarely can plan on attending annual meetings held on the West Coast, and vice versa. Other societies (for example, the Geological Society of America, the American Association of Petroleum Geologists, and the Paleontological Society) have long ago established Pacific Coast branches, and it seems to me the time has come that we, too, should do so.

I must emphasize that the plan is not to divide the Malacological Union but merely to organize a separate western section that would hold its own annual meetings, probably earlier in the year than the meetings of the main society. Reports on both meetings could be included in the annual report or news bulletin of the Secretary. Anyone who wished to could attend both meetings, and at any time it seemed desirable, a joint meeting of the two sections could be held, perhaps in the Central States.

The members of the Council with whom I have been able to talk (Maxwell Smith, John Burch, and Allyn Smith) welcome the plan as offering possibilities of increasing the membership and of adding to the prestige of the A. M. U.

I should like to have an expression of opinion from the remainder of the Council on two points:

- 1) Do you consider the plan feasible and desirable?
- 2) Is a vote of the membership necessary, or may we go ahead with plans for a meeting next spring or summer, before the next Annual Meeting of the A. M. U.?

Any suggestions you have to offer will be most welcome, and if the general response seems to indicate that a formal council meeting and vote of the membership is not necessary, I shall keep you informed as to further action. Otherwise, I shall discuss the matter with you at the council meeting next year in Pittsburgh.

Sincerely,  
Myra Keen

JOSHUA L. BAILY: "Yes, it is both desirable and feasible, it is better to go ahead now with a convention before next summer, if a large number of West Coast malacologists approve."

ELMER G. BERRY: "There seems little doubt that the Union would be larger, more active, and therefore stronger if the same organization functioned on both sides of the continent. I am all in favor of seeing established the Pacific Section of the A. M. U. and I will attend as many of their annual meetings as may be possible."

CALVIN GOODRICH: "The proposal to erect a western section of the A. M. U. strikes me as admirable. If in the matter my approval would count for anything I would vote for it."

LOUISE M. PERRY: "It seems to me that the suggestion . . . is excellent and well conceived. I should favor it."

H. R. ROBERTSON: ". . . It should be constructive and strengthening to have a Pacific Coast Branch of our A. M. U."

IMOGENE C. ROBERTSON: "Yes, some plan could be worked out to give the West Coast members as much help and pleasure in meetings as those of the east enjoy."

HENRY VAN DER SCHALIE: "I am much in favor of a western section of A. M. U. It is in keeping with similar sections in other organizations and should help to strengthen our organization for better understanding and mutual aid."

On the more technical question of how much initiative should be taken by Western members before the next Council meeting, there was a wider range of opinion. Four members (Dr. Perry, Mr. and Mrs. Robertson, and Dr. van der Schalie) made suggestions that might be synthesized thus: That, provided West Coast members are interested enough in the plan to carry it out, an organizational meeting be held sometime in advance of August, 1948. This would be in effect the first annual meeting but would not be formally called such. At this meeting *protempore* officers would be elected, including a delegate to the next A. M. U. Annual Meeting, and a petition would be prepared to be presented to the Council at that meeting outlining the plans and objectives of the western section. Council discussion and vote of the membership present at the meeting would settle final details as to relationship of the Branch to the parent organization.

As a first step in carrying out the plan, Dr. Keen has asked Mr. John Burch to serve as Chairman of a committee to explore possibilities for scheduling a meeting of the West Coast membership. He has reported that the Conchological Club of Southern California is enthusiastic about a West Coast organization.

## NOTES

The presentation to our Secretary briefly mentioned in the minutes for June 19, has now been carried out. Following the suggestion of Council, the President appointed Mrs. Margaret Teskey a committee of one to inquire into the possibilities for a suitable gift. After inquiry, she selected a radio which proved a pleasant surprise to our Secretary, judging by her enthusiastic letter of thanks.

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It was a great disappointment to your secretary that the serious illness of a member of her household prevented her attendance at the Annual Meeting. In her absence Aurèle LaRocque was appointed Acting Secretary, and all will agree that he did a splendid job. His report of the activities of the meeting are graphic, and the abstracts of papers and discussions are unusually complete. The secretary is very grateful to him for the preparation of this major part of the Bulletin.

The secretary takes this opportunity also to express her heartfelt thanks for the generous gift of the portable radio voted her at the meeting. It is a constant reminder of the friendships which the Union has brought about and which are so precious even in those cases where the pleasure of a personal meeting has not as yet been enjoyed.

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After travelling north along the coast as far as Tillamook Oregon, and then east, we have finally settled here in the Adirondack Mountains for a month's rest. . . . Before we left Pacific Grove, Miss Coats invited us to spend a few days at Tillamook on the Oregon coast. We accepted her kind invitation and spent three of the most interesting days with her. . . . We were lucky enough to have a minus tide, of course at 5 o'clock in the morning and were able to walk out on the rocks for a great distance. The rocks were literally covered with starfish of all colors, most brilliant reds, greens, blues, and yellows, and then there were pockets of the most beautiful sea anemones I have ever seen. It was more beautiful than any aquarium I have been to. We collected many chitons and some smaller shells and were fully repaid for getting up so early in the morning. Miss Coats was certainly a wonderful hostess.

Edna Haas

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At the September meeting of the Conchological Section of the Buffalo Society of Natural Sciences, Mrs. Margaret Teskey and Eugene H. Schmeck reported on the Pacific Grove meeting, the only members of the local group to attend. Both spoke especially of the welcoming committee, Andrew Sorensen, Mrs. A. T. Whelchel, and Mrs. John Q. Burch, who made every one feel at home immediately. Their accounts of the early morning collecting, the tide pools, and the rocks, the papers and the discussions, the annual dinner with the special sea food, made their hearers enjoy, in imagination, this unusual meeting too, all hoping that next time they may be more fortunate and able to attend in person.

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The Conchological Section of the Buffalo Society of Natural Sciences celebrated its fiftieth anniversary on Saturday evening, November 1, with a dinner at which the two charter members, Mrs. Fred St. John Hoffman and Mrs. Harold R. Robertson, were honored, each being the recipient of a book on shells inscribed with the names of the members.

Those present at this meeting were, Mrs. Wallace H. Ashbery, Mr. and Mrs. Clifford L. Blakeslee, recording and corresponding secretaries, respectively, Dr.

and Mrs. Fred St. John Hoffman, the latter treasurer of the Section, Mr. and Mrs. Harold R. Robertson, the latter its president, Miss Jean Russell, Mr. and Mrs. Eugene H. Schmeck, Mrs. Margaret M. Teare, vice-president, Mr. and Mrs. Percy H. Teskey, and Miss Gertrude Weber.

The Section was organized in 1897 by Elizabeth J. Letson who, at the time, was a Jessup scholar studying at the Academy of Natural Sciences in Philadelphia with Dr. Henry A. Pilsbry. In 1909 Dr. Letson, then Director of the Museum of the Buffalo Society of Natural Sciences, prepared "A Partial List of the Shells of Erie and Niagara Counties From the Records of the Conchological Section," which was published by the Buffalo Society of Natural Sciences the same year. This year a new list is being published by the Society which comprises the records made by Mr. Blakeslee since 1934, with descriptions of species prepared by Mrs. Robertson. The book is titled, *The Mollusca of the Niagara Frontier Region and Adjacent Territory*, and contains illustrations of all but a few of the 230 and more species and varieties listed.

## THE FOURTEENTH ANNUAL MEETING

The 14th Annual Meeting of the American Malacological Union will be held in Carnegie Museum, Pittsburgh, Wednesday, Thursday, and Friday, August 25, 26, 27, 1948.

Rooms are being reserved at Hotel Webster Hall, which is just one block from the Carnegie Museum.

The local committee consists of: Gordon K. MacMillan, Chairman; Dr. O. E. Jennings, Dr. G. E. Clapp, Dr. A. E. Dietze.

More detailed announcement will be made as to rates, etc. early in 1948.

## BOOK REVIEW

A Field Guide to the Shells of our Atlantic and Gulf Coasts by Percy A. Morris; 190 pages; over 400 illustrations. \$3.50. The Field Guide Series, edited by Roger Torey Peterson. Houghton Mifflin Company, Boston. The Riverside Press.

This is the book that observant visitors to the seashore have been waiting for. How many of you have gathered shells on the beaches and sought vainly in shops and libraries for the book which would help you to identify them without too much trouble. The books available usually are either too technical for the casual collector or, if non-technical, describe too few species, seldom the one you happen to have.

This compact little volume is about 5 inches by seven, and less than an inch thick, small enough to carry in your pocket or handbag. It covers the ground so well that most of the shells likely to be picked up at random on Atlantic shores from Labrador to Texas are here described in clear, concise, simple language. It is illustrated as well, sometimes in color, so that instead of being discouraged by a fruitless effort to name your shells, you will find yourself able to label your specimens correctly and actually to catalog them in a scientific way.

The system of cross indexing is especially helpful, from description to illustration and back again. We miss the names of authors of species, omitted, doubtless, because such names mean little or nothing to the beginner although important to the taxonomist.

Mr. Morris is chief preparator at the Peabody Museum of Natural History of Yale University and president of the New Haven Conchological Club. We congratulate him on a very fine piece of work.

## ACTIVE MEMBERS

- Abbott, R. Tucker, Museum of Comparative Zoology, Cambridge, Mass.  
Aldrich Museum, 12 Bay Island Club, Balboa, Cal. Conch., mineralogy exch.  
Alexander, Robert C., 423 Warwick Rd., Wynnewood, Pa.  
Allen, Charles A., 1094 S. King St., Honolulu 53, T. H.  
Ancona, Prof. Ignacio, Instituto de Biologica, Chapultepec, Casa de Laga, Mexico D. F., Mex.  
Andrews, Elizabeth, 605 Pershing Dr., Silver Spring, Md. Col. on outer banks, N. C. coast.  
Andrews, Mrs. James N., Somerset, Va.  
Archer, Harry B., 7239 Third Ave., N., St. Petersburg 6, Fla.  
Ash, F. G., 14142 Meyers Rd., Detroit 27, Mich.  
Atwater, Rev. David T., 50 Grace Court, Brooklyn, New York 2, N. Y.  
Bailey, Prof. John Wendell, 27 Willway Rd., Richmond 21, Va.  
Baily, Dr. and Mrs. Joshua L., Jr., 4435 Ampudia St., San Diego, Cal.  
Baker, Dr. and Mrs. Horace B., Zoological Lab., Univ. of Penn., 38th St. and Woodland Ave., Philadelphia, Pa. Res. 11 Chelten Rd., Havertown, Pa.  
Balch, Prof. Francis N., 130 Prince St., Jamaica Plain, Mass.  
Bales, Mrs. Blenn R., 149 West Main St., Circleville, O.  
Bartlett, Mrs. R. D., 200 Cedar Croft Rd., Baltimore 12, Md. E. coast shells Md. to Fla.  
Bartsch, Dr. Paul, Smithsonian Institution, U. S. National Museum, Washington 25, D. C.  
Bayer, Frederick M., Div. of Marine Invert., U. S. Nat'l Museum, Washington 25, D. C.  
Beatty, Mrs. Harold C., Mingo Lodge, Skaneateles, N. Y.  
Belanger, Alice Lois, Indian Springs Farms, Riverdale Ave., R.F.D. 1, Eatontown, N. J.  
Bequaert, Dr. Joseph C., Museum of Comparative Zoology, Cambridge 38, Mass.  
Berger, Mr. and Mrs. John N., 3496 Brookline Ave., Clifton, Cincinnati, O.  
Berry, Dr. and Mrs. Elmer G., National Institute of Health, Bethesda, Md.  
Bippus, Alvin C., Jr., 1918 Bayard Pl., Toledo 6, O. Col. Marine univalves.  
Blake, Dr. Charles H., Dept. of Biology, M. I. T., Boston, Mass.  
Blakeslee, Clifford L., Mendon Center Rd., Pittsford, N. Y. Exch. land, fresh water, and marine shells.  
Bloom, Robert J., 104 Eloise Terrace, Syracuse 7, N. Y.  
Boehm, Mrs. C. H., 305 West Main St., Palmyra, N. Y.  
Boelio, Mrs. Nellie A., 181 Kedzie Dr., East Lansing, Mich.  
Bollinger, Mrs. C. C., Lakeview, Mich.  
Bormann, Mrs. Mary, 4331 Vermont St., Long Beach 14, Cal.  
Bourgeois, Miss Marie E., 3a Tiziano 35, Mixcoac D. F., Mex.  
Bower, William J., 340 3rd St. S., St. Petersburg, Fla.  
Brand, Dr. Donald D., Dept. of Geog., Univ. of Mich., Ann Arbor, Mich. Latin Am. land shells.  
Brewster, Miss Helen M., 500 2nd Ave. S., St. Petersburg 5, Fla.  
Briscoe, Dr. M. S., 4208 Benning Rd., N.E., Apt. 3, Washington 19, D. C.  
Briskas, James, 703-707 S.E. 6th Ave. and 7th St., Fort Lauderdale, Fla., Dealer.  
Bristol, Viola S., Natural History Museum, Balboa Park, San Diego 1, Cal.  
Brookshire, Jack, 948 E. Beverly Ave., Bellflower, Cal. South Pacific marines.  
Bruce, Karl L., 12 Florence St., Roslindale, Mass.  
Burch, Mr. and Mrs. John Q., 4206 Halldale Ave., Los Angeles 37, Cal.  
Burch, Dr. Paul R., 614 W. Fourth St., Radford, Va.  
Burch, Thomas A., M.D., Nat'l Inst. of Health, Bethesda, Md.  
Burkhardt, Lorilee, 62 Lexington Ave., Holyoke, Mass.  
Burr, Dr. Harry B., 503 Medical Arts Bldg., Houston, Tex.  
Burrow, Mrs. F. H., 1401 Plass Ave., Topeka, Kan.

- Burry, Mr. and Mrs. Leo A., Burry's Marine Museum, Pompano, Fla.  
Byrd, Mrs. Curtis, 1415 Northeast 4th Place, Fort Lauderdale, Fla.  
Byrnes, Miss Betsy, 154 Dartmouth St., Holyoke, Mass. Worldwide shells.
- Caldwell, Walter C., 3444 1st Ave. N., St. Petersburg, Fla.  
Camman, A. F., 515 N. E. Sixth St., Box 203, Ft. Lauderdale, Fla. *Liguus*.  
Chace, Mr. and Mrs. E. P., 24205 Eshelman Ave., Lomita, Cal.  
Champion, Dr. Merrill E., 42 Anderson St., Boston 14, Mass.  
Cheever, Dr. Austin W., 464 Beacon St., Boston 15, Mass.  
Cheever, John Alden, 47 W. Cedar St., Boston 14, Mass.  
Chen, Suifong, U. S. National Museum, Washington 25, D. C.  
Chenoweth, Paul, 2090 Beach St., San Francisco 23, Cal. Marine invert. natural habitat.  
Church, Austin, 165 George St., Trenton, Mich. P. O. Drawer C.  
Ciarla, Otello, Rua Augusta 91, Rio de Janeiro, Brazil. Local and foreign shells; books.  
Claar, Elmer A., 617 Thornwood Lane, Northfield, Ill. Coll. *Cypraea*.  
Clarke, Mrs. Effie M., P. O. Box 511, Yuba City, Cal.  
Clench, William J., Curator of Mollusks, Mus. of Comp. Zool., Cambridge, Mass. Coll., exch., buy.  
Coats, Ruth E., 702 E. First St., Tillamook, Ore. Exch. f.w. and Puget Sd. marines.  
Cockerill, Mrs. Lilias F., Sanibel, Fla.  
Colitz, Mrs. Samuel, 15 Capwell Ave., Pawtucket, R. I. Oct. to June, Box 1084, Hollywood, Fla.  
Cooke, Dr. Montague, Jr., Kualii, 2859 Manoa Rd., Honolulu 54, T. H.  
Corbett, William Phelps, 185 Grove St., Plainfield, N. J. Exch. rare *Cypraea*, *Murex* and *Oliva*.  
Cram, Dr. Eloise B., Federal Security Agency, U. S. Public Health Service, National Inst. of Health, Bethesda, Md.  
Crosby, William, San Mateo, Fla.
- Damron, Mr. and Mrs. Michael C. E., 29-D Venetian Way, Miami Beach, Fla.  
Darbaker, Dr. L. K., 424 Franklin Ave., Wilkinsburg 21, Pa.  
D'Attilo, Anthony, 102 Hilltop Acres, Yonkers, N. Y.  
Demond, Joan, 830 S. Burnside, Los Angeles 36, Cal.  
Desmond, Hon. Thomas C., P. O. 670, Newburgh, N. Y.  
Dexter, Dr. Ralph W., Dept. of Biology, Kent State Univ., P. O. Box 507, Kent, Ohio.  
Diaz, Dra. Amy E. Aguilar, San Benigno, No. 504 Altos, Santos Suarez, Habana, Cuba.  
Dodge, Henry, 6 Rochambeau Rd., Scarsdale, N. Y.  
Donovan, Mrs. James W., P. O. Box 8927, West Palm Beach, Fla.  
Doremus, E. C., 227 Holmes Ave., Boonton, N. J.  
Drake, Robert J., Dept. of Anthropology, Univ. of New Mexico, Albuquerque, N. M.  
Dranga, Ted., 3462 Main Highway, Miami 33, Fla.  
Dury, Dr. Ralph, Director, Cincinnati Soc. of Nat. Hist. Mus. and Lib. Cincinnati, Ohio.  
Edwards, H. Arden, Southwest Museum, Los Angeles 41, Cal.  
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# AMERICAN MALACOLOGICAL UNION

FOUNDED 1931

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Membership in the American Malacological Union is open to anyone interested in the study or collection of shells. The annual dues are one dollar. There is no initiation fee. For further information, address the Secretary, Mrs. Imogene C. Robertson, 136 Buffum Street, Buffalo 10, New York. For the convenience of applicants for membership an application blank is given below, but its use is not mandatory.

## OFFICIAL ORGAN

The official organ of the Union is the NAUTILUS, a quarterly devoted to the interests of conchologists. Editors and Publishers: Henry A. Pilsbry, Curator of the Department of Mollusks, Academy of Natural Sciences, Philadelphia, and H. Burrington Baker, Professor of Zoology, University of Pennsylvania, 38th Street and Woodland Avenue, Philadelphia. Subscription to the Nautilus is \$2.00 per year (\$2.15 to foreign countries) 50c a copy.

## MEETINGS

Since its foundation, the Union has met once a year in a place chosen by the membership at large. Meetings were suspended during the war and resumed in 1946.

## PUBLICATIONS

The Union publishes annually its "News Bulletin and Annual Report" which is printed in uniform size with the NAUTILUS and may be bound with it if desired. The Annual Report contains accounts of the Annual Meetings, a list of members of the Union, and obituaries of prominent members deceased during the year. In addition, the Union has published the following biographic and bibliographic memoirs:

Scientific Contributions made from 1882 to 1939 by Henry A. Pilsbry, Sc. D. 63 pages, 1940. 50 cents a copy.

A Bibliography and short biographical sketch of William Healy Dall. By Paul Bartsch, Harald Alfred Rehder, and Beulah E. Shields. Smithsonian Miscell. Coll. vol. 104, no. 15, 96 pp., portrait. (Published in large part from fund contributed by the American Malacological Union.) 50 cents a copy.

Annual Report of Meeting in 1941 with Symposium papers on Methods of Collecting and Preserving Mollusks. 50 cents a copy.

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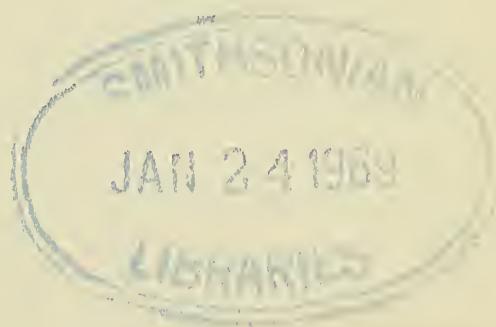
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Membership List Revised,  
March, 1949

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# THE AMERICAN MALACOLOGICAL UNION FOURTEENTH ANNUAL MEETING

PITTSBURGH, PENNSYLVANIA. AUGUST 25 TO 27, 1948

Who could have foretold that Pittsburgh would experience the warmest bit of summer weather in nearly fifty years, just when the fourteenth annual convention of the American Malacological Union met there? This unforeseen adversity, shared at that time by many sections of the country, may have been in part responsible for the decreased attendance this year. It had little apparent effect on the interest of the assembled group, for the formal meetings were well attended, and informal discussion groups were to be found in the Carnegie museum and at the Hotel Webster Hall until all hours.

Registration was held from ten o'clock until noon on Wednesday morning, August 25, in the Ornithological hall of the Carnegie Museum. After registering, those members who were not in attendance at the council meeting took advantage of the opportunity to renew acquaintances and form new ones, or to study the many excellent exhibits.

All of the papers were read in the lecture hall of the museum, an amphitheater of ample proportions and adequate facilities. Several interesting exhibits were arranged there. One case contained photographs and signatures of conchologists of Western Pennsylvania; those included were: H. H. Smith, A. E. Ortmann, G. H. Clapp, S. N. Rhoads, J. Green, V. Sterki, W. E. Burnett, and S. T. Brooks. Another exhibit showed "Types of mollusca of Western Pennsylvania and Vicinity," including a central map with the shells marginally placed, each assigned to its locality with a ribbon. Mr. and Mrs. H. S. Young displayed several cases of colorful shells, including a box of *Conus*, one of Australian shells, and others from Fort Myers, Florida and of world wide distribution.

The first meeting for the presentation of papers began at two o'clock on Wednesday afternoon, with an address of welcome by Dr. O. E. Jennings, Director of the Carnegie Museum. He said apologetically that he expected cold and "clammy" weather but under the circumstances he could tender a "warm" welcome in every sense of the word. He told us the staff of the organization would aid in any way they could. The unusual activity in the Museum was in preparation for a dual celebration dedicated to "Pennsylvania Week" and the "Pursuit of Happiness Week." In the latter category special emphasis would be placed on hobbies. Since natural history studies, and especially natural groups like mollusks, afforded ideal avocations for many people, Dr. Jennings regretted that some of us could not be present when those aspects of the program were presented.

Dr. Jennings kindly gave a short resume of the unique position of the Carnegie Museum as a part of a larger civic center which also includes a University, a Bureau of Mines, and group of hospitals. The Museum itself contains sections of Art, Music, Natural History and a Library. These cultural fields are all in one building and there is an element of cooperation among these units. In the Museum of Natural History, which would quite naturally be of special interest to our malacological society, there are some six million specimens distributed among several exceptionally fine special collections. Of special prominence is the Fossil Hall, which contains one of the best assemblages of Jurassic reptiles found anywhere; among the insect collections the Butterfly assemblage, which includes the famous Holland and Avinoff collections, is especially out-

standing. There are plans to develop the cultural resources of the region of Pittsburgh and some excellent progress has already been made in that direction. For example, the University contains a series of nationality rooms where the various national groups of the city show the special and outstanding characteristics of their culture. In concluding his address of welcome, Dr. Jennings called attention to the now famous foyer of the Music Hall where some seventeen different marbles are beautifully displayed. A specially conducted tour was arranged for those who wished to take advantage of the opportunity to see this work of art.

After Dr. Keen's gracious reply in acceptance of the welcoming address, Dr. Bartsch presented the first paper on malacology.

## MOLLUSCAN GENETICS: THE ROLE OF HYBRIDIZATION, MUTATION, ISOLATION, FIXATION AND SPECIATION IN RELATION TO TAXONOMY

BY PAUL BARTSCH

In devoting a lifetime of effort to our chosen field, I have met with a number of problems not covered by the usual approach of nomenclature and taxonomy. When I began my study of the family Pyramidellidae a half century ago and prepared the manuscript for the monograph on the "West American Pyramidellid Mollusks" I was sorely puzzled what valuation should be assigned to the various groups, natural assemblages of species.

Discussing this problem with Dr. Dall, who had agreed to become joint author of this effort and serve as a check to a possibly over-enthusiastic novice, we decided to recognize four genera, *Pyramidella*, *Turbonilla*, *Odostomia* and *Murchisonella*, and align the various natural groups as sub-genera under them. Doing so, Dr. Dall believed we would avoid the criticism of having created too many genera.

(A fear to be criticized seems always to be lurking in the minds of our molluscan students which *now* appears to me the greatest deterrent to real clean progress).

I yielded to the doctor chiefly because *Odostomia (Chrysallida) virginalis* D. & B. was so enormously variable as far as sculptural characters are concerned that one might consider some individuals as properly placed under the sub-genera (*Evalina*) or (*Evalea*). *Turbonilla (Pyrgiscus) tenuicula* (Gould) was another puzzling species.

Later I found Pyramidellids in the Lower San Pedro series which were equally variable in that horizon, and it appears that out of that mutating complex several fixed forms have emerged and established themselves in the Upper San Pedro Series. (I have not yet published my MS. on these forms). When I monographed the New England Pyramidellids I found another mutating form, *Turbonilla (Pyrgiscus) Vinae* B. These mutating forms have characters which when once known easily enable one to recognize the species. It is interesting to note that such mutating forms seem always more abundant and more widely distributed than the stable, fixed species. Mutating forms appear in many widely unrelated groups of mollusks; for example, *Helicostyla (Prochilus) virgata* Jay from the Island of Mindora, Philippines is very variable.

*Goniobasis virginica* Say, our common East American species, is very interesting. Above the Fall Line (Potomac River), uniform size individuals are found which are smooth and usually have a color band, while in the reaches of the lower freshwater tidal area we have a uniform sized multilirate form—*Goniobasis virginica multiliniata* (Say). At the meeting of these two areas we

have a most variable mutating complex, forms differing enormously in size and varying in sculpture from smooth to spirally lirate and even axially ribbed or marked by varying combinations of these characters. It was this enormous variability that caused Hannibal to lump almost all the *Goniobasis* under *Goniobasis virginica* Say. The seeking for an explanation and solution of the problem connected with *Goniobasis* mutation eventually drove the poor fellow to the mad house.

Another man who went off on a tangent was Dr. Sinitzin whose study of the intermediate host of the liver fluke of our cattle uncovered in our southwestern states a mutating mollusk *Stagnicola bulimoides techella* (Haldeman). Using the usually accepted anatomic characters for superspecific designation he created new subfamilies, new genera, and species, basing them on his dissection of individuals of this mutating complex. Refusal of the Department of Agriculture's Zoological Division to accept his manuscript for publication caused him to resign his position in that institution which resulted in a tragic aftermath.

My Cerion breeding on the Florida Keys (1911-1948) has thrown some light upon the problem of molluscan mutation, and I hope next year to re-visit my families on the Florida Keys and to prepare a summary report upon these experiments. So far they point to two things: 1. Changed environment per se appears to produce no measurable changes in the species experimented with. 2. Hybridization *C. incanum* Rin. x *C. viaregis* B. also *C. incanum* x *C. casablancae* B. has caused enormously variable progeny (mutations) after the second generation. This definitely points to an explanation for the probable cause of the other mutations referred to above. Here, too, we have a decided efflorescence in numbers which is in agreement with the other cases alluded to.

In *Cerion* hybrids changes in form, sculpture, and coloration are combined with equally variable anatomic structures. In one extreme individual the reproductive system was doubled. We have in the wild state without human assistance similar mutating hybrids; for example, *Cerion tridentata* Pilsbry and Vanatta x *Cerion peracuta* Torre. Where these two species meet on Playa de Muerto on the north coast of Havana Province, Cuba they mutate. On Little Cayman Island there are two colonies of *Cerion nana* Maynard where these colonies each meet an undescribed species of Cerion similar mutating results are present.

These and many additional observations lead me to conclude that hybridization in mollusks produces mutations and that these seem more prolific than stable species and become more widely spread. Furthermore, that when these are isolated in small colonies as are, for example, the Cerions along South Right, Andros Island, Bahamas, where every little ridge separated by a swale extending away from this channel has a colony of Cerions whose members have fixed characters that readily distinguish them from adjacent or other colonies. In other words, they have undergone fixation and become species, meeting my five point formula: hybridization, mutation, isolation, fixation, speciation.

Now for an application of the above biologic features to taxonomy.

For many years I have been interested in the family Urocoptidae. I published my first paper in 1906, *The Urocoptid Mollusks from the Mainland of America in the Collection of the United States National Museum*. To this I have added from time to time as material became available. Dr. De la Torre and I have about completed our monograph of the Cuban members of the family, some of the figures of which I am showing on these walls.

Recently a suggestion has been made to lump a number of mainland superspecific groups since it has been found that in Arizona certain species are very mutable as far as internal lamination is concerned. These in their range of varia-

tion combine lamellar characters that appear constant for groups of Mexican species which also by other shell characters appear supra-specifically related. I am wondering if here we are not also dealing with a mutating complex which has not yet undergone fixation, and it would not serve a better purpose to place an \* against the name of these forms, placing them in the group to which the rest of their characters ally them, calling attention that the lamellar characters in them are unstable rather than lumping all the other supra-specific groups that have constant fixed lamellar features that fall within the range of these mutating forms under a common designation.

Dr. Bartsch also told us of his current research — a study of the *Urocoptidae*, and displayed a large chart of pictures of shells of this family from the American tropics. We were all pleased to receive a copy of an interesting paper by Dr. Bartsch and Miss Mary Quick, "An Anatomic Study of *Zonitoides Arboreous* Say," copies of which were presented to the audience by Dr. Bartsch.

## DISTRIBUTION OF MOLLUSKS IN A BASIC BOG LAKE AND ITS MARGINS BY RALPH W. DEXTER

Over a period of ten years, mollusks were collected from a small bog lake located on the divide between Lake Erie drainage and Ohio River drainage at Twin Lakes, Ohio. This glacial lake has an area of about 6 acres, with a maximum depth of 23 feet. It is circular in outline with concentric zones of submerged, floating, and emergent vegetation. On one side is a bog shelf of sphagnum moss with leatherleaf, poison sumac, huckleberry bushes, and tamarack trees. On the other is a swamp-type shelf with cattails, buttonbush, alder, willows and on the upland, hardwood forest. The temperature range is from 0°C. to 28°C. The range of hydrogen ion concentration is from pH 6.7 to pH 8.6. Curves were presented to show the monthly fluctuation of temperature and hydrogen ion concentration at depths of two-feet intervals for two and one-half years. There is a complete "overtur" in the spring and fall, resulting in uniform conditions from top to bottom, with stratification of temperature and pH during the summer and winter seasons. The water is usually alkaline which explains the presence of such a rich molluscan population in a lake which is otherwise largely glacial bog in character. Nineteen species of gastropods and three genera of sphaeriids have been found, each one confined to a rather narrow margin in the water or shoreline zones. Details on the distribution of each species were given.

This paper was greatly enhanced by colored slides of the lake studied by Dr. Dexter, so that the audience obtained a graphic view of the habitats. Dr. Jennings asked if the soil substrate of the lake had been tested for percentage of hydrogen ion concentration, and Dr. Dexter replied that though this examination was beset with technical difficulties, such tests as he had made indicated it is slightly acid. At Presque Isle in Lake Erie, Dr. Jennings noted, the sandy peninsula at the east end is continually added to by sand bars; at each successive addition, a freshwater pond is formed behind the marginal dune. The ponds are of increasing age as one proceeds westward, the oldest dating back to perhaps forty years ago. The younger ponds are alkaline, but older ones are acid, and have a thin layer of acid soil over a deeper substrate which is alkaline. Dr. Dexter replied that he did not know the depth of the bottom ooze material in the lake which he studied; the organic nature of this material is probably the cause of

the acid condition, while photosynthesis of the phytoplankton and vascular aquatic plants probably push the pH balance toward the alkaline side. Dr. van der Schalie noted that silting would be a drain of the available supply of dissolved oxygen, and thus perhaps a primary factor in explaining the absence of mollusca in certain areas of the lake, as well as being important in the pH balance. He further inquired about the finding of larger land snails in the oak zone, noting that in his experience oak woods have been unproductive of larger snail forms. Dr. Dexter replied that the wooded area consists of a rather narrow strip on the edge of the bog, with no transitional zone of vegetation; this area of hardwood trees is never flooded, and consists of red and white oak, as well as elm, maple and others. Some trees are large enough to suggest that they are of the original forest.

## MORPHOLOGICAL STUDIES ON TROPICORBIS HAVANENSIS (PFEIFFER) BY ELMER G. BERRY

(Approved for publication in the Proceedings of the American Malacological Union  
by R. E. Dyer, Director National Institutes of Health.)

Research work on members of the genus *Tropicorbis* has been one of the projects in the Division of Tropical Diseases at the National Institutes of Health for the last four years. A member of this genus is the only known snail in the continental United States which is capable of serving as an intermediate host of the human blood fluke *Schistosoma mansoni*. This snail, which was collected in Louisiana, was identified as *Tropicorbis havanensis* (Pfeiffer) as a result of its comparison with the description and figures of *T. havanensis* given by F. C. Baker and a comparison with shells in this collection. His specimens which were also collected from Louisiana were, however, misidentified. The soft parts and radula of *T. havanensis* from Havana, Cuba, the type locality of this species, have never been figured or described in any publication so far as is known.

Specimens of *Tropicorbis* were collected from Baton Rouge, Louisiana and Havana and Matanzas, Cuba during May and June 1948. A comparative study of the shells, the characters of the radulae and genital organs were made and figures prepared. The Louisiana specimens differ in many ways from *T. havanensis* which were collected in Cuba. These differences were found in the shell, in the formulae of the radulae, and in the characters of the intermediate and marginal teeth. Dissimilarities were also observed in the organs of the genital systems.

*Tropicorbis havanensis* of Cuban origin has, thus far, proved to be refractory as an intermediate host of *S. mansoni*. The Louisiana species of this genus is being described as a species new to science.

Very excellent colored slides of the animals and shells, as well as charts of the University Lake at Baton Rouge, Louisiana, were used to illustrate this paper. Dr. Berry emphasized the distinctness of the Louisiana snail, generally referred to as *Tropicorbis havanensis*, from that of Cuba, on both physiological and anatomical grounds; Dr. Pilsbry asked what Dr. Berry called the Louisiana material, and Dr. Berry replied that he would designate it as a new species. To Dr. Pilsbry's further inquiry about its possible relationship with other species of *Tropicorbis* in the Gulf area, Dr. Berry replied that he has compared it with material from Central Texas, Mexico, Cuba and Guatemala, and still considers it distinct. Dr. Bartsch commented that he considers Schistosomiasis as worthy of attention as tuberculosis; he recalled that during the recent war a picture in the

press of allied soldiers frolicking in a freshwater pond in the orient had attracted his attention, and he was struck by the apparent disregard of the allied forces for schistosomiasis. He called the picture to the attention of official agencies, with the result that they became interested. *Schistosoma mansoni* was introduced to the New World by the negro, but not to the North American continent. Dr. Bartsch also cited an outbreak of this disease on one of the West Indian islands, from using a water supply from a polluted source; the disease had been introduced locally by means of monkeys brought from infected areas and released on the island.

After a brief recess, Dr. Keen read a telegram of felicitations from Mrs. Robertson: "With you in spirit. Regret enforced absence because of Harold's temporary infirmity. Greetings from Imogene and Harold Robertson." We were sorry that the Robertsons could not be with us again this year, and hoped for the speedy recovery of Mr. Robertson, and their attendance at the next annual convention. During the meetings, a copy of Mrs. Robertson's very recent publication was passed around, and received much favorable comment: "The Mollusca of the Niagara Frontier Region and Adjacent Territory" by I. C. S. Robertson and C. L. Blakeslee; Buffalo Museum of Science Bull. 19, No. 3.

## SECOND INDEX TO THE NAUTILUS — A REPORT OF PROGRESS BY J. A. AURELE LA ROCQUE

As reported to this society last year at Pacific Grove<sup>1</sup> the Michigan group has been working on an Index to the Nautilus similar to the one already issued for the first 34 volumes. The work has now progressed to a point where it will soon reach completion and where ways and means of financing its publication will have to be considered. The purpose of this report is two-fold: to acquaint the members of the AMU with the present state of the work and to suggest a method for financing the publication of the index.

First to report on work done: cards have been prepared on which an entry has been made for each genus, subgenus, and species appearing in the Nautilus from volume 35 to volume 60 inclusive. Other cards have been prepared for every article appearing in the same volumes and an alphabetical list by authors has been typed in triplicate. Some of you may already know of this through the postcards which Miss Geneva Smithe, one of the compilers of the Index, has sent through the mails in order to give as fully and correctly as possible the name of each contributor to these volumes of the Nautilus. The response to our inquiries has been most co-operative and we take this opportunity of acknowledging it. As you will recall, the first Index to the Nautilus (volumes 1-34) consisted of an author index and a systematic index. The author index for volumes 35 to 60 is now complete except for minor additions such as a few names which we are hoping to get in full and a few birth and death dates. The systematic index consists of two parts, as in the first index: an alphabetical list of genera and species, and a cross-index which is combined with the list of genera and species. The first part, i.e. the alphabetical list of genera and species, has now been completed. Cross-references have been included for subspecies and varieties.

The work which remains to be done is as follows: re-arrange the species cards alphabetically, species first, into a cross-index by species, and incorporate this into the genus-species index. Subgenera will be cross-indexed to the proper genus. After that, the entire index will be checked back against the volumes of the Nautilus and corrections made as needed.

<sup>1</sup>Amer. Malac. Union, News Bulletin and Annual Report, 1947, p. 11.

To summarize, the work of indexing the *Nautilus*, volumes 35 to 60 is now more than half done and workers to finish it are available. At the next annual meeting of the AMU, if not before, we hope to lay before you the completed manuscript of the index, ready for the printer.

This meeting will have an opportunity to examine that part of the index which has now been completed. The compilers will be happy to receive suggestions for its improvement.

The present index follows as much as possible the plan of the first. Some changes have been proposed and incorporated into the new index for two reasons: a) to reduce printing costs, and b) to increase the usefulness of the work. Some of these changes are as follows: (1) a list of obituaries appearing in the *Nautilus* for the volumes indexed has been introduced at the end of the author list. It includes the full name of the subject of the obituary, his or her birth and death dates, the name of the writer of the obituary, and the volume and pages of the *Nautilus* in which it appears. It is hoped that this list will be a useful addition to the information in the index. (2) The author list in the first index has been printed with a liberality in type-setting which improves the appearance of the volume but increases its size considerably. It is proposed to set the author index in smaller type in the new index and in two columns, in order to save space. (3) The method of giving the volume and page in the first index has been changed in order to eliminate the use of boldface and to condense the reference without losing any of its clarity. The use of one font for the entire systematic index should result in considerably lower printing costs.

Up to the present, the project has been financed entirely by the Museum of Zoology, University of Michigan. This has included the major part of the time spent on the project by the compilers, the materials used in its preparation, and facilities for checking and filing. The same arrangement will take care of the completion of the manuscript but its publication is a project which probably cannot be financed by the University of Michigan alone.

Several possibilities have already been discussed and some of them seem promising. Three of these are presented at this time for your consideration.

(1) Publication by subscription in advance.—As soon as printing costs have been ascertained, it will be possible to fix a price for the published volume and to open a subscription list. This would mean that only the exact number of copies subscribed for would be printed and these would be distributed as soon as printed. This plan has the advantage of not requiring large financial commitments in advance by anyone and it eliminates the necessity of storing a number of extra copies for future distribution. It has the disadvantage of causing the volume to be out of print as soon as it is published.

(2) Revolving publication fund.—It is suggested that the AMU might establish a fund for the publication of the index and accept subscriptions to it until the cost of publication is met. The published volume would then be distributed by the AMU and proceeds of the sales would be returned to the revolving publication fund to be used by the AMU for other publications which it may think worthwhile.

(3) Combination plan.—This would be a combination of plans (1) and (2). Subscriptions would be received for the Index and a sufficient number of copies printed to cover the subscription list. In addition, the AMU would contract for a number of copies from a fund established for that purpose and distribute these at a higher cost after publication; proceeds of the sales from this plan to be placed in its publication fund.

These three plans are merely offered for your consideration and the compilers do not wish to express advocacy of any one of them. Our wish is merely to solicit your advice on the best method of printing the index and making it available to those whom it is designed to serve. We would recommend, however, that the profit margin be reduced to as little as possible in order to place the index within the reach of the younger workers in the field.

As Dr. La Rocque could not be present, the proposed second index to "The Nautilus" was presented by Dr. Henry van der Schalie, along with the brief paper by Dr. La Rocque. A copy of the nearly completed index was left on the desk, for the perusal of the audience. Dr. Keen noted that the subject of publication had been discussed at the Council meeting, and that further attention would be given to it at the business meeting tomorrow.

### LOUIS PFEIFFER, THE AUTHOR OF POLYGYRA HIPPOCREPIS BY H. E. WHEELER

Ferdinand Roemer, the father of the Geology of Texas, discovered *Polygyra hippocrepis* at New Braunfels in 1848. It was described by Pfeiffer in the Appendix to Roemer's *Texas*, published in 1849. New Braunfels is the only known locality.

Roemer's year and a half in Texas produced a remarkable literature on American geology and paleontology, his contributions claiming his interest to the very end of his life. The talents, training, and interests of the geologist parallel those of Pfeiffer in many respects.

Pfeiffer was born in Kassel, Germany, in 1804. His grandfather, Carl Jonas, was a distinguished malacologist, the author of the earliest and most important of treatises on European shells. Louis was educated as a physician but after his marriage devoted himself entirely to researches in botany and malacology. He was a voluminous writer in both fields, a skilled artist, an accomplished musician, a master of the classical as well as several modern languages.

In 1838 he made his historic trip to Cuba accompanied by Dr. Edward Otto and Dr. Johannes Gundlach, and the study of American, European, and Philippine shells claimed his attention for more than forty years. He died in his native city, Kassel, and is buried there. The mantle of scientific interest and research has fallen on his grand-nephew, Dr. Karl Pfeiffer, erstwhile banker of Kassel, from whom many details of the family life have been obtained.

In the absence of Mr. Wheeler, this informative paper was presented to the group by Mr. MacMillan; Dr. Pilsbry commented that Pfeiffer was to be commended for his fine ideas of specific differences, which were superior to many of his contemporaries, who in general lacked a sense of natural affinities. Pfeiffer republished all previous descriptions of land mollusca in his Monographia. In the field of marine conchology Pfeiffer was not as proficient. Mr. Wheeler's account was especially commendable because he had communicated directly with descendants of this renowned conchologist, in preparing his biography.

At 6:30 on the evening of August 25, Dr. Jeanne S. Schwengel honored the convention with a refreshing cocktail party and dinner, much enjoyed and appreciated by all who attended. Through Dr. Schwengel's graciousness we were all made to feel at ease, and opportunity was taken to continue the informal discussions on many varied topics. The Union extends her our heartfelt thanks.

Thursday morning, August 26 was begun by a business meeting, at which time President Keen announced that the officer's reports were open for inspection, but that time would not be taken to read them.

The new slate of officers (as listed on page 34) were presented, and nominations from the floor were in order. No further nominations were made. Mr. E. Sidney Marks moved that the nominations of the Council be accepted. The motion was seconded by Dr. Ralph Dexter; carried.

The recommendation by the Council that messages be sent to Mrs. Robertson, Dr. Carlos de la Torre, Mr. George Clapp, and Dr. C. Montague Cooke, expressing the regret of the group assembled that they could not meet with us, was endorsed.

The President gave a short review of the problems that attended the selection of a place for our meeting next year. In view of the uncertainty of the arrangements, Dr. Bartsch moved that the matter of arranging for a selection be left to the discretion of the Council because otherwise the process of making the decision would make too much work for the secretary. Mr. Abbott seconded the motion; carried.

The President then gave the essential information previously discussed in the Council meeting concerning the formation of the Western Division of the American Malacological Union. In the discussion which followed Mr. E. Sidney Marks suggested that the chairman of the western division might be considered as a second vice-president as is done in other national organizations. Moved and carried.

#### HISTORY OF MARINE MALACOLOGY ON THE PACIFIC COAST OF NORTH AMERICA BY A. MYRA KEEN

The early period of West American malacology might be called a period of exploitation, when sea-farers, travelers, and visiting naturalists carried their finds back to Europe and the eastern United States. There the material was eagerly studied and described by scientific men of the day. This period ended with P. P. Carpenter's critical summary of the literature and check-list of Pacific Coast marine mollusks in 1864, and the second period, of work by resident collectors, began with the publication of a first local list by R. E. C. Stearns in 1867. During the second period much competition among collectors brought hundreds of new species to light, but although paratypes and identified specimens remained on the Pacific Coast, the actual determinations and descriptions were almost entirely the work of East Coast malacologists to whom the material was sent. The bulk of these determinations and descriptions were made by Dr. Dall and his associates, Dall alone describing 1,021 species. Again, the publication of a check list brought an end to a period; this was Dr. Dall's U. S. National Museum Bulletin 112, in 1921, in which 2,122 species were listed. The third period, of relatively independent work by westerners, dates from Mrs. Oldroyd's four-volume elaboration of the Dall check list, and since that time (1925-1927), both identification and research have been carried on mainly on the local level.

The large collections made by early workers have formed the nuclei of a number of institutional collections, and the material is now permanently preserved under professional care, notably at the California Academy of Sciences, San Francisco; San Diego Society of Natural History; the University of California

at Berkeley, California; and Stanford University, Stanford, California. Marine stations for biological research are maintained by most of the universities of the coast—eight in all, from San Diego northward to Vancouver Island, B. C.

Conchological clubs have played an active part in the development of shell collectors, here as elsewhere. The Conchological Club of Southern California, organized about fifty years ago, and in more recent years its sister organization, the Long Beach Shell Club, have enabled novice collectors to learn from those more expert and have provided a medium of exchange both of information and of specimens for the many active workers of Southern California. Now it is hoped that the proposed Pacific Division of the A. M. U. will do the same service for workers in other areas of the western United States.

Mr. Abbott inquired about the status of private collections of the west coast, noting that many of them contained type material and other specimens of great and permanent importance. Dr. Bartsch commended Dr. Keen's account, and regretted that she had not told us more, for the subject is worthy of an extensive review. Dr. Pilsbry noted that the unillustrated species of Carpenter are a headache, and that Dr. Catherine van Winkle Palmer is presently trying to get figures of all of Carpenter's minute west coast species. Mr. Marks and Mr. Tobleman asked about the disposition of several private collections of people now deceased, and Dr. Keen replied that the Fred Baker collection went to the San Diego Society of Natural History, as did the Lowe collection, which was furthermore accompanied by an endowment of \$20,000; the latter collection contained about 12,000 species, of world wide distribution, though mostly from the tropics. The Oldroyd collection, numbering about 15,000 species, was bequeathed to Stanford University.

#### A RECENTLY OBSERVED SNAIL DISEASE BY ELMER G. BERRY

In the rearing of aquatic and amphibious snails in the laboratories of the National Institutes of Health a highly contagious disease which is fatal to nearly 100 per cent of the affected snails has been observed on four occasions within the last two years. The disease was first observed in a shipment of *Australorbis glabratus* from Puerto Rico, the second and third instances in laboratory-reared *A. glabratus*, and the fourth in a shipment of *Biomphalaria pfeifferi* and *Physopsis africana* received from Monrovia, Liberia.

The disease appears to be caused by a short rod, gram-negative bacterium which grows as a translucent colony on agar. It manifests itself first in the tips of the tentacles and causes them gradually to rot away. A swelling precedes the necrosis. The tentacles gradually become insensitive to mechanical stimuli and can be pulled off with a pipette. Within a few hours the snail becomes listless and involvement of the neuromuscular system becomes evident. The snail is unable to open the pneumostome, it ceases to eat, excessive quantities of mucin are discharged, and hemorrhaging directly anterior to the auricle is frequently observed. Death follows within a few hours.

Healthy snails when placed in the affected water died within 17 to 36 hours in the following order: *Biomphalaria boissyi*, *Australorbis glabratus*, *Bulinus contortus*, *Oncomelania quadrasi*, and lastly *O. nosophora*. The studies of this disease are still in the experimental stage. Whether it is of any practical importance as an antibiotic of snails which serve as intermediate hosts for diseases of man remains to be seen.

This paper was illustrated by several excellent slides in natural color, which showed the dwindling of the animal's tissues in a most remarkable manner. Dr. van der Schalie asked about the use of snail diseases for use in snail eradication, and particularly the work of Mr. Kuntz in Egypt. Dr. Berry replied that Mr. Kuntz is using a phenol derivative to try and rid certain regions of snails which are vectors of Schistosomiasis. Mr. Marks expressed concern over the possibility of upsetting the balance of nature by such methods, and possibly totally destroying a natural population in a given area. Dr. Berry thought this hardly likely, saying that the natural population is reduced, not destroyed, and that upsetting the ecological balance of nature does not occur in the overall picture. Dr. van der Schalie inquired about the cause of pitting of the shells of the snails, which was vividly displayed by the colored slides: these shallow pits are rounded in outline, and suggest erosion of the shell. Dr. Berry reported that they seem to be caused by the rasping of the shell of a snail by the radula of other snails, and this is merely a chance phenomenon, probably not done for food requirements (calcium); rather, the radula of these planorbid snails is at work most of the time while the snail is active, and when it comes upon another shell, this rasping may break the periostracum of the latter shell, allowing erosion by carbonic acid dissolved in the water. He reports that the number of pits seems directly proportional to the number of snails per unit volume of water. Harold Harry cited an article in the Proceedings of the Malacological Society of London (vol. 23, pp. 92-96, Pl. 7, of 1938) by Boycott, A. E. and C. Oldham, entitled "A Contagious Disease of *Helix aspersa*." The disease is apparently much slower in its activity, altering the subsequent growth of the shell; it might be considered in the eradication problems of exogenous populations of *Helix aspersa*, but only after specificity of the disease for this snail has been more thoroughly proved. Dr. Bartsch, finding sweet the uses of adversity, commented upon the beneficial effects of the war in stimulating the investigations of such problems as Dr. Berry is studying; the ravages of the cattle liver fluke in the United States alone amounts to some \$25,000,000 annually; he hoped, however, that systematists would have a chance to study any areas, before they are subjected to the dangers of having their natural populations destroyed. Dr. Berry reported that in one place in Cuba, 10,000 cases of the common sheep liver fluke (*Fasciola hepatica*) are known in humans, caused by the eating of infected water cress.

#### BIOGRAPHIC NOTES ON ARNOLD EDWARD ORTMANN AS REVEALED BY SOME OF HIS LETTERS BY HENRY VAN DER SCHALIE

Arnold Edward Ortmann was curator of Recent Invertebrates in the Carnegie Museum for almost a quarter century (1903-1927). His distinguished service in this institution is in itself ample reason for brief mention of some of his contributions to malacology. In fact, since 1907, when Ortmann shifted his main interest from studies of the decopod crustaceans to fresh-water mussels, the Carnegie Museum published many of his mollusk papers.

Dr. Ortmann was an unusually industrious man as is well attested by the numerous long and informative letters he carefully penned to his friends and colleagues. Through these letters many of his creative concepts are clearly indicated. His attitude toward his colleagues was unusually constructive and wholesome and his willingness to cooperate with those who asked for aid was usually far beyond what would ordinarily be expected. In systematic work he combined a keen sense for evaluating species and genera with great diligence

and fairness in arriving at sound solutions for systematic differences. These qualities are especially noticeable in his contribution towards clarifying certain names proposed by Rafinesque. Throughout all of his work Ortmann showed an intense interest in zoogeography. His contributions in this field are both highly scientific as well as unusually extensive. Some may differ with his conclusions but his work was so thorough and scientifically sound that the facts he submitted will forever stand as a monument to this eminent scholar.

Dr. Pilsbry commented on Dr. Ortmann's extraordinary ability to concentrate all of his mental powers on the immediate problem with which he was concerned. He lived in his work. In the field, he was of indefatigable endurance, and, said Dr. Pilsbry, he carried this to extremes, tiring out all of his companions, including Dr. Pilsbry. Mr. MacMillan regretted that Dr. Ortmann had limited himself to the study of so few groups of animals, and that he had not collected more land shells; he further reminisced that he had attended a lecture by Dr. Ortmann on metrology, when he was a freshman in college; that was shortly before the close of Dr. Ortmann's life. Dr. Jennings also recalled his intimate acquaintance with Dr. Ortmann, and obliged us with a few intimate details of his life: he had been pro-German during the first World War, though an American Citizen; he was a chain smoker of cigars; Mrs. Ortmann often wore, on formal occasions, a long, double string of pearls by which Dr. Ortmann had come in his studies of the *Unionidae*.

### SMALL BEGINNINGS BY ADLAI B. WHEEL

A material object may be the means of stimulating the mind into research or study. Children should be encouraged to collect and should be taught to display their treasures according to the principles of taxonomy.

As a boy of twelve I was given a basket of shells, the beginning of a small museum of natural history. Later I was given a few fossil shells which stimulated me to study further. I glued my treasures in both the top and bottom of a box and whenever we had visitors I always brought forth and displayed my treasures hoping for the suggestion that our guest had something at home that he or she might offer to add to my growing collection. I read what books were available on the subject of the natural sciences and was always on the alert looking for the unusual rock or formation and later trying to learn something about each new find.

Many years later an organization of men garden hobbyists decided to have a hobby show. On this occasion I brought forth innumerable boxes of my treasures. I was surprised at how many interesting things I had collected. As I was packing up this material after the display I could not help but feel that there must be many boys in the city in which I lived that were constituted with the same kind of natural curiosity about things as I had been and so I resolved to try to develop a group of boys where we could exchange knowledge and learn together in the spirit of fun and adventure. I found that there were boys that responded and soon we were meeting once a week at the Syracuse YMCA and later in a small vacant store where we had a very neat and well labeled museum of our wonders. Later I was approached by the general secretary of the Y requesting me to bring my program or hobby to the YMCA as a part of their boys' division program.

I have been with the Boys Division of the YMCA for about 5 years and I hope that through showing interest in both the boy and his curios I have gently

aided in the moulding of their lives. Many of my boys have made remarkable strides in collecting and also in appearing before audiences and explaining about their displays. A few of the displays made by the boys I have brought along.

Four years ago I was invited to conduct a similar program at the Syracuse Boys Club where again a small natural history museum was developed. Directly and indirectly this work comes in contact with about five thousand of the children of our city.

During the past three years a group of adults interested in natural sciences — the Syracuse Museum of Natural History — has been having a part in the making up of a portable museum of natural history which moves in small sections into the class rooms of our schools each week. To date we have made between twenty-five and thirty-five educational displays a few of which I have brought along.

The Syracuse Society of Natural History is doing its best to create a consciousness of the need in our city of a museum of natural history. We have put on displays in churches and in our public library as well as the school loan material which we circulate. This work has been supported by our small dues of \$5.00 per year plus here and there a gift.

I have asked for time to present my story before you for the reason that I believe that each and every one of you may have certain duplicate materials or unwanted natural history materials which you may feel that you will want to share.

There are two thoughts that I want to leave with you — the material object owned by a child should be explained patiently to him so that he will greater appreciate the oddity or the unusual which he may have found. Secondly we must be patient with the boy or girl with a natural curiosity for the day may come when we will recognize them as the scientists of tomorrow.

We can scarcely do justice in reporting the captivating effect which this worthy paper had upon the audience, and, we hope, will continue to have. Mr. Wheel had with him a number of portable cases, each prepared by a youngster, illustrating some subject of natural history. The exhibits themselves were originally built in cardboard cartons, of the type discarded by any department store; these cartons were chosen of uniform size, however, so that they would fit into a plywood carrying case, for convenient carriage to the school room or to a club's lecture group. Each case was a marvel of perfection, neatness, accuracy and attractiveness; indeed, they would rival or easily surpass similar materials prepared by commercial natural history establishments, or companies dealing in material aids to education. To mention only a few of the subjects presented, we noted: the story of copper, and similar boxes on salt, coffee, and others; in mollusca, there were cases on *Cypraea*, *Natica*, land shells, *Nerita*, *Conus*, *Cassis* and many others. Everyone who reads this is urged to comply with Mr. Wheel's humble request, that duplicate shells and other objects of natural history be donated to continue the work.

## THE CAVE SNAILS OF EASTERN NORTH AMERICA BY J. P. E. MORRISON

Within the past ten years cave snails have been discovered in a number of limestone caves of Eastern North America in the Appalachian and Ozark regions. All of the truly cavernicolous snails of Eastern North America now known belong to the Freshwater Prosobranch family Amnicolidæ. On the basis of male reproductive anatomy, etc., this family is divided into only four subfamilies:

1. *Hydrobiinæ* with one functional duct (vas deferens) in the verge of males.
2. a. *Bythinellinæ* with two functional ducts (vas deferens) and "flagellum") in verge; operculum corneous, pauci-spiral.
2. b. *Buliminæ* with two functional ducts in verge; operculum calcareous; secondarily concentric.
3. *Emmericiinæ* with three functional ducts (vas deferens, "flagellum" and "accessory gland") in verge of male.

All but one of the American cavernicolous snails known to date belong to the subfamily Emmericiinæ, along with their American surface-living relatives, members of the genus *Fontigens*. Like the species of *Fontigens* they are limited to colder waters; the cave species are limited to underground headwaters ecologically suitable to them. Usually these snails are found only on rock or gravel bottoms in the rapid parts of these very small streams.

The anatomical relations of the genus *Fontigens*, and most other North American cave snails, with the genus *Emmericia* from Dalmatia present an interesting zoogeographic problem.

Because of the complete and long continued isolation of populations in their terminal headwater stream habitats, there may be a different species in each locality in which they now live. This holds true for all the American cave species so far discovered and for some members of the related surface genus *Fontigens* both in the Appalachian and Ozark regions.

The only other type of American cave snail, undoubtedly a relict species in the Shenandoah region, is a member of the otherwise European cavernicolous genus *Lartetia* of the subfamily *Hydrobiinæ*.

This species is known only from a travertine pool habitat, where it makes up for lack of water movement by its own locomotor activity.

On the basis of loss of pigment and eye structures, the North American cavernicolous Amnicolids now known, separate readily into three groups:

1. The species that have lived underground longest have no eye pigment or eye-structure whatsoever.
2. The *Lartetia* species has no eye pigment, but otherwise apparently normal eye structure.
3. The species that entered the caves most recently possess very little pigment; pigmented eyes are present but reduced in size.

The present biology of our North American cave snails indicates that they invaded the caves from the surface during three successive periods of cave development. According to the present zoogeographic distribution of the cave snails and their surface relatives, their ancestors reached the Appalachian region from the west, when the Blue Ridge was still the stream divide between the eastern and the western slopes of the Appalachian uplift.

This paper was illustrated by slides showing distributions, and external anatomies of the snails; it elicited much and varied comment from the audience. Dr. Pilsbry opened the discussion by commending this as a very important piece of work. Drs. Baker, Bartsch, Berry and van der Schalie then inquired about the technical methods used and about specific points of progress in the investigation: microtome sections of the eye region, radular studies, and studies on the pigmentation of the shell are yet to be done; the degeneration of internal structures of the eye (as optic nerve) may in part be determined by the presence or absence of a light refracting streak, in whole mounts. Coloration of the shell in this

group is possibly due in part to algæ, for surface dwelling forms, or manganese precipitate for certain cave dwelling forms. Dr. Baker said that he had found alcohol to be a better fixative for small snails than Bouin's solution. Dr. Berry emphasized the importance of data concerning anatomy and correlated with ecology and distribution which is exposed by this study, and he further noted that the names, in such a problem, are merely matters of opinion.

"UTILIZATION OF MOLLUSKS BY THE WAMPANOAG INDIANS  
OF MASSACHUSETTS"

BY FRANK G. SPECK AND RALPH W. DEXTER

Field trips to Cape Cod and Martha's Vineyard were made in the summer of 1940, 1946, and 1947 to study past and present utilization of marine life by the Wampanoag Indians. Information from informants, correlated with biological surveys of the region and with published accounts of shell-heap excavations, show that mollusks were the most important group of marine organisms in the economy of this ethnic group. Species which are or have been used for food, bait, ornaments, temper, and utensils are as follows: *Ostrea virginica*, (oyster); *Pecten irradians*, (bay scallop); *P. grandis*, (deep sea scallop); *Anomia simplex*, (jingle shell); *Mytilus edulis*, (blue mussel); *Volsella demissus*, (ribbed mussel); *Mercenaria mercenaria*, (quahog); *Ensis directus*, (razor clam); *Spisula solidissima*, (sea clam); *Mya arenaria*, (soft-shelled clam); *Polinices heros* and *P. duplicata*, (sand collar snails); *Crepidula fornicata*, (boat shell); *Littorina littorea*, (English periwinkle); *Buccinum undatum*, (English whelk); *Busycon canaliculatum* and *B. carica* (pear conches); and *Loligo pealii* (squid). Specific uses for each were discussed. In addition to these 18 species, five others have been found in shell-heaps for which no use is known. Probably they were collected incidentally along with food mollusks and reached the shell-heaps in that manner. They are: *Argina campechiensis pexata*, (combed ark); *Tagelus gibbus*, (bivalve); *Urosalpinx cinereus*, (oyster drill); *Nassarius trivittata*, (sand snail); and *N. obsoletus*, (mud snail).

Mr. MacMillan commented that the Indians of the interior regions ate freshwater mussels, and that land snails were probably eaten also; in an Indian mound deposit near Pittsburgh, some five species of mussels and nineteen species of terrestrial snail shells were found. Dr. Morrison said that his studies of Indian kitchen middens in the Tennessee Valley<sup>1</sup> favored the conclusions of Mr. MacMillan; the Indians ate such mollusks as could be easily obtained from the river; shells of deep water species were rare or absent. Pleurocerids were apparently eaten, but Amnicolid shells were probably introduced to the midden accidentally. Land snails were apparently not eaten. Dr. van der Schalie asked if there was any evidence of the mollusks being cooked before eaten, and if so, by what method<sup>2</sup>, and Dr. Dexter replied that nothing of this was known with any certainty, though burnt stones were found in the middens; it is likely that the animals were eaten raw.

<sup>1</sup> Morrison, J. P. E., 1942. Preliminary Report on Mollusks Found in the Shell Mounds of the Pickwick Landing Basin in the Tennessee River Valley. Bureau Amer. Ethnology, Smithsonian Institution, Bull. 129, pp. 339-392.

<sup>2</sup> Baker, F. C., 1941. A Study in Ethnology of the Prehistoric Indians of Illinois Transactions Amer. Philosophical Society, N. S., 32:1, pp. 51-78.

THE FRESHWATER MUSSELS OF THE MISSISSIPPI RIVER FROM ST. PAUL  
TO THE MOUTH OF THE MISSISSIPPI RIVER  
BY HENRY VAN DER SCHALIE

Collecting in large rivers is difficult unless one has dredging equipment and motor boats. This report is based on collections made by Dr. M. M. Ellis who made collections and observations at 254 stations in the Mississippi River. The work was done during two summers, 1930 and 1931. The fauna consists of twenty-five genera and thirty-nine species of mussels. The distribution of each species in the 659 miles of river covered was shown graphically by means of a faunal distribution chart. The fauna throughout this extensive portion of the main river is surprisingly uniform.

Dr. Bartsch recalled that in 1907 Congress directed the Federal Bureau of Fisheries to investigate the mussel resources of the Mississippi and Ohio Rivers, and that he was directed to make the survey; because of subsequent matters of pressing importance, he has never published any but the preliminary report of this survey; the material is still stored in the National Museum, and would make a splendid addition to the present study. Dr. Morrison recalled another large series of material from Fairport, Iowa, at the same institution. Dr. van der Schalie cited the value of independent work in the same field, as valuable in substantiating conclusions, and expressed the hope that others might undertake the study of the materials mentioned.

MOLLUSKS AND MEDICINE IN WORLD WAR II  
BY R. TUCKER ABBOTT

A brief account was presented of the part played by mollusks and malacologists mainly in the Pacific theatre of operations. The snail-carried disease, schistosomiasis or blood fluke, was contracted by over 1700 army and 17 navy men on Leyte Island in the Philippines. An extensive educational campaign was put into operation by the medical corps to prevent our men from swimming in infected waters. The Army sent out to the Philippines, and later Japan, the Commission on Schistosomiasis, headed at first by Dr. Ernest Carroll Faust and later under the direction of Dr. Willard H. Wright, chief of the Division of Tropical Diseases at the National Institute of Health. From Commodore Thomas Rivers' unit on Guam, the navy dispatched two doctors and a malacologist. The use of the latter, a mollusk man, represented the first time that a military organization had employed a malacologist for snail research.

The habits and distribution of the intermediate snail host, *Oncomelania quadrasi*, was discussed in short. Recognizing the guilty species of snail was done not only by studying the shell, but principally by observing the features of the living animal. *Oncomelania* snails were found to possess a combination of animal characters not present in any other Philippine or Oriental snail — two delicate gray tentacles at the bases of which is a small black eye surmounted by a bright lunar splotch of yellow color granules. This last distinctive feature was referred to for convenient identification purposes among medical men as "yellow eyebrows."

Locating small endemic areas of Schistosomiasis was made difficult by the migration of thousands of people during and after the war. Tracking down colonies of infected snails was supplemented by trapping and inspecting wild rats which serve as blind reservoir hosts for the blood fluke.

In connection with chemical control experiments, the life history of the *Oncomelania* snail was worked out in detail. The most difficult task was in finally locating the small, single eggs of the snail which the female lays on moist wood and covers with a tiny sand jacket.

Other trematode diseases of man were discussed in brief with a short account of their life histories and intermediate snail hosts. So far as is known there were no records of fatal cone shell bites among our troops in the Pacific. This article (15 pages and 6 illustrations) will appear in the next issue of the Appendix to the Smithsonian Institution Annual Report.

This splendid paper stimulated several to inquire about the intended place of publication, and Mr. Abbott replied that it would be in the appendix of the Annual Report of the Smithsonian Institution. His paper received very favorable comment in the local press next day.

#### A PRELIMINARY REPORT OF MOLLUSCAN FAUNAL ZONES IN PEORIA SILT (PLEISTOCENE)

BY A. BYRON LEONARD AND DOROTHEA S. FRANZEN

The Peoria silt, a member of the Sanborn formation, is a massive, structureless, homogeneous deposit, gray to buff in color, ranging from a few feet to 30-40 feet in thickness. There is no visible stratification, except very locally, where ponds formed on the old loess surface.

Since there is reason to believe that the Peoria silt represents more than one interval of Pleistocene time, this study was undertaken to determine whether or not there might be faunal changes within the deposit. This report includes data from only 3 of the 20 or more localities in northwestern Kansas that will be included in this study.

Gastropod mollusks were taken at intervals of 5-10 feet. The fauna, consisting of 25-30 species is grouped into 3 faunal zones. In the lower zone eleven species are represented of which *Succinea grosvenori*, *Pupilla muscorum* and *P. blandi* are predominant. In the Transition zone, 13 species are represented. Eight species, *Euconulus chersinus*, *Helicodiscus singelyanus*, *Pupilla blandi*, *P. muscorum*, *Succinea avara*, *Vallonia gracilicosta*, *Vertigo gouldi paradoxa*, and *Vertigo modesta* are in the Transition and also in the Lower and Upper zones. *Succinea grosvenori* is found in the Transition and Lower zones. Three species, *Columella alticola*, *Discus shimeki*, and *Hawaiia minuscula* are found in the Transition and Upper zones. In the Upper zone, 17 species are represented of which 5 are restricted to this zone: *Cionella lubrica*, *Discus cronekitei*, *Pupoides albilibris*, *Retinella* species, and *Zonitoides arboreus*.

Dr. Franzen illustrated this paper with slides of charts showing relative percentages of a given species in the population of each horizon studied. Dr. Baker noted that *Striatura milium* is mostly boreal today, and that it had been present in limited ranges only, in the diagrams which Dr. Franzen presented; could this information be an aid in interpreting former climatic conditions?

#### SOME TECHNIQUES FOR MOUNTING SPECIMENS IN THE MUSEUM

BY A. MYRA KEEN

Backgrounds for specimens to be exhibited in glass-topped boxes often are a problem. Soft crepe tissue-paper of the paper-handkerchief type, especially

tissue colored a soft blue or green, may be used to advantage. Stretched taut by friction between the edges of the upper and lower sections of the box, the paper forms a smooth, wrinkle-free background. If reinforced below by cotton, the paper may be made to hold a shell in any desired position.

Smooth round shells are hard to display in a flat exhibit case without gluing or wiring them to some support. It is suggested that a small paper tray painted the color of the show-case background and filled with melted paraffin, against which the shell is balanced just as the paraffin cools, will make a permanent mount from which the shell can later be detached without damage.

By courtesy of Dr. G. D. Hanna of the California Academy of Sciences, a sealed glass mount of specimens in alcohol was demonstrated. This method of sealing was described at the Thirteenth A. M. U. meeting in Pacific Grove last year by Mr. Allyn Smith.

This paper was of considerable interest to all present; it might be noted that the sealed vial of alcohol material which Dr. Keen displayed contained the eggs of *Achatina achatina*, the same of which Dr. Hanna wrote in the July 1948 issue of the *Nautilus* (p. 30). They appeared to be about twice the size of eggs of *Achatina fulica*.

Gordon K. MacMillan was the last speaker on the formal program.

### SHELLS AND MASTODON BY GORDON K. MACMILLAN

The first report of the discovery of the remains of a *Mastodon* in this country occurred in 1705 at Claverack, Columbia County, New York, was contained in a letter received by Cotton Mather from Gov. Joseph Dudley and an item published in the Boston News Letter on July 30, 1705. Since that time remains of this *Proboscidean* have been discovered in nearly every state of the Union, and in many cases associated with land and fresh water mollusca. In the early part of February, 1948, there was unearthed a few bones of a *Mastodon* during the process of the removal of a seam of coal by the strip mining method in Bridgeville, a small community about 10 miles southeast of Pittsburgh, Pennsylvania. Associated with these remains in a grayish clay some 5-10 feet above the coal were 14 species of land and fresh water mollusca. This is the first occurrence in Pennsylvania of the association of a *Mastodon* with shells. Since this clay, in which the bones of this animal reposed, indicates deposition in a pond or lake, the freshwater forms predominate. The four species of land snails occurring in the balsam forest surrounding the lake indicates that the climate around Bridgeville was not only cold but also damp. The presence of these snails and the balsam trees indicates also that the climate was cooler than at present, not arctic, but more of a cold temperate one. The species of mollusca associated with the *Mastodon* at Bridgeville are *Valvata tricarinata* (Say), *Helisoma anceps* (Menke), *Helisoma anceps striatum* (FCB), *Gyraulus deflectus* (Say), *Amnicola limosa* (Say), *Ferrissia rivularis* (Say), *Ferrissia* sp.?, *Lasmigona viridis* (Raf.)?, *Sphaerium simile* (Say), *Sphaerium simile planatum* Sterki, *Discus cronkhitei* (Newc.), *Discus patulus* (Desh.), *Gastrocopta armifera* near variety *similis*, and *Pomatiopsis lapidaria* (Say).

In the evening, at 6 o'clock, the annual banquet was held in the University Room of Hotel Webster Hall. Dr. Elmer Berry, our new president, presided in the absence of Dr. Keen, who unfortunately was called away on business. A program of the meeting was passed around for autographs, and later sent to

Mr. George Clapp, with a message expressing our regrets that he could not meet with us this year. After a brief recess, the convention reassembled to enjoy a set of excellent colored slides and commentary by Mr. Charles B. Wurtz, on his trip to the islands of the Caribbean Sea. Several types of terrestrial and marine habitats were displayed in natural color, and we all gained a more intimate knowledge of the region. Very remarkable were several superb slides of porpoise, in their favored pastime of racing just below the surface of the water, in front of the ship.

The following account of the field trip is contributed by Gordon K. MacMillan:

The field trip scheduled for Ohiopyle, Fayette County, Pennsylvania, for August 27th was cancelled because there were not enough autos for transportation. Instead, a collecting trip was made to Sandy Creek Valley, formed by Sandy Creek running in a northwesterly direction from the small village of Sandy Creek to empty into the Allegheny River nine-tenths of a mile away. This village lies about 6 miles in a northeasterly direction from Pittsburgh.

Dr. J. P. E. Morrison and Dr. E. L. Palmer furnished their cars for transportation, taking with them Frank L. Jeffries, E. Sidney Marks, Mrs. Margaret Teare, Mrs. Margaret Teskey, Gertrude M. Weber, James M. Ross, Eugene H. Schmeck, Dorothea Franzen, Mrs. E. L. Palmer and Gordon K. MacMillan.

The party left the entrance to the Carnegie Museum about 10 o'clock in the morning. Collecting during that part of the day was made along the northeastern flats and hillsides of Sandy Creek just below the village of Sandy Creek. That area was not too overgrown with hardwoods and shrubs, mostly second and third growths. In the more open spaces were many herbs, flowers, and weeds. Lunch was eaten at Futules Cafe in Verona, a borough along the Allegheny River about a mile and a half north of the entrance of Sandy Creek into the Allegheny River. After lunch collecting was continued on a rather steep hillside covered with moderate growths of trees and shrubs. This locality was situated on the southwestern side of Sandy Creek Valley. This place constituted a significant collecting locality as quite a number of specimens of *Hendersonia occulta* (Say) were found here. This species has a very sporadic distribution throughout the northeastern section of the United States, and this find at Sandy Creek constitutes the fourth locality record for Allegheny County since Jacob Green reported it first in 1832 at *Helicina rubella*. In the morning, among the loose rocks and stones on the flats of Sandy Creek were gathered specimens of *Oxychilus draparnaldi* (Beck). Most of the other species of larger and commoner forms found throughout the northeastern section of the United States were collected here by the party.

Since the area around Sandy Creek is within the industrial region of Pittsburgh, the members of the collecting party became quite dirty by the end of the days activities from contact with the smoky and sooty underbrush, leaves and logs. The heat of the day, the thermometer standing at 98 degrees, was another factor contributing towards this condition. Inspite of the dirt and heat, I believe that this collecting trip was very successful, as attested by the large number of specimens collected by all participating in this event.

Respectfully submitted

HAROLD W. HARRY  
Acting Secretary.

## **MEMBERS AND VISITORS IN ATTENDANCE**

Mr. R. Tucker Abbott, Washington, D. C.  
Dr. H. B. Baker, Philadelphia, Pa.  
Dr. Paul Bartsch, Washington, D. C.  
Dr. Elmer G. Berry, Bethesda, Md.  
Mr. Robert Bloom, Syracuse, N. Y.  
Dr. Olga Catizone, Pittsburgh, Pa.  
Miss Ruth E. Coats, Tillamook, Ore.  
Dr. L. K. Darbaker, Pittsburgh, Pa.  
Dr. Ralph W. Dexter, Kent, Ohio.  
Dr. A. G. Dietze, Pittsburgh, Pa.  
Miss Dorothea Franzen, Hillsboro, Kan.  
Dr. H. M. Hall, Pittsburgh, Pa.  
Mr. Harold Harry, Ann Arbor, Mich.  
Mr. and Mrs. Frank L. Jeffries, Washington, D. C.  
Dr. and Mrs. O. E. Jennings, Pittsburgh, Pa.  
Dr. A. Myra Keen, Stanford, Cal.  
Mrs. K. G. Kutchka, Pittsburgh, Pa.  
Mr. Gordon K. MacMillan, Pittsburgh, Pa.  
Mr. and Mrs. K. D. MacMillan, Pittsburgh, Pa.  
Mr. E. Sidney Marks, Leonards, N. J.  
Dr. J. P. E. Morrison, Washington, D. C.  
Dr. and Mrs. E. L. Palmer, Ithaca, N. Y.  
Dr. Henry A. Pilsbry, Philadelphia, Pa.  
Dr. Harald A. Rehder, Washington, D. C.  
Mr. James Ross, Ann Arbor, Mich.  
Mr. Eugene H. Schmeck, Niagara Falls, N. Y.  
Dr. Jeanne S. Schwengel, Greenwich, Conn.  
Mrs. Margaret M. Teare, Buffalo, N. Y.  
Mrs. Margaret Teskey, Buffalo, N. Y.  
Mr. and Mrs. Fred Tobleman, Newark, N. J.  
Dr. Henry van der Schalie, Ann Arbor, Mich.  
Miss Gertrude M. Weber, Buffalo, N. Y.  
Mr. Adlai B. Wheel, Syracuse, N. Y.  
Miss Jane White, Pittsburgh, Pa.  
Mr. Charles B. Wurtz, Philadelphia, Pa.  
Mr. and Mrs. Henry S. Young, Pittsburgh, Pa.

## **THE FIFTEENTH ANNUAL MEETING**

The Council of The American Malacological Union have accepted an invitation from Dr. F. G. Walton Smith, Director of the Marine Laboratory of the University of Miami, Miami, Florida, to hold the fifteenth annual meeting at the University, June 16 to 19, 1949. The facilities of the University dormitories will be available for the delegates at moderate rates, and there will be collecting trips along shore and by boat from the Marine Laboratory.

Announcement of rates and other details will be made later. Please notify the secretary before June 1st, of the titles of papers and time required.

Mrs. Harold R. Robertson, *Secretary*,  
136 Buffum Street, Buffalo 10, New York.

# **THE PACIFIC DIVISION OF THE AMERICAN MALACOLOGICAL UNION**

**DR. A. MYRA KEEN**

The organization meeting of a western coast section of the American Malacological Union was held at Los Angeles, California, April 10 and 11, 1948 in the auditorium of the Hancock Foundation at the University of Southern California, and the Los Angeles County Museum respectively. The following plan was adopted, pending approval by the Council and membership of the American Malacological Union.

That the western section be known as the Pacific Division of the American Malacological Union, or, in abbreviation, the A. M. U. P.

That any persons west of the Mississippi River may affiliate with the Pacific Division if they so prefer.

That the officers shall consist of a Chairman, a Vice-Chairman, a Secretary-Treasurer, and an Executive Council of four additional members who shall be the four immediate past chairmen. (During the first four years vacancies shall be filled by direct election.)

The duties of the Council, except the Secretary-Treasurer, shall be to arrange for annual meetings of the Division. Council members shall assist the Chairman in any way needed.

The Secretary-Treasurer shall be empowered to accept A. M. U. dues and to maintain a list of affiliated members. Dues shall be transmitted to the Treasurer of the A. M. U. and a list of members sent to the A. M. U. Secretary.

Annual meetings of the A. M. U. P. shall be scheduled in advance of the A. M. U. meetings so that abstracts of papers given may be printed as part of the proceedings in the annual report of the parent society.

All of these provisions were approved by the Council and membership at the annual meeting in Pittsburgh with the stipulation that the membership lists and dues be transmitted at least annually.

It was further provided by vote of the membership that the Chairman of A. M. U. P. become automatically a Second Vice-President of the A. M. U.

In accordance with the above provisions officers of the A. M. U. P. were elected as follows: Chairman, Miss Ruth E. Coats; Vice-Chairman, John Q. Burch, Dr. Leo G. Hertlein, Secretary-Treasurer. Councillors additional to officers: Dr. S. S. Berry, Dr. Joshua L. Baily, Jr., Dr. A. Myra Keen, and Dr. Wendell O. Gregg.

## **MINUTES OF THE ORGANIZATION MEETING OF THE PACIFIC DIVISION (A. M. U. P.)**

At 10 o'clock Saturday morning April 10, 1948, about 40 enthusiastic conchologists gathered in the small auditorium of the Hancock Foundation at the University of Southern California.

Dr. A. Myra Keen called the meeting to order and Mr. Allyn G. Smith moved: "That we organize a provisional Western Division of the American Malacological Union — subject to the approval of the parent organization." The motion was seconded from the floor and after discussion unanimously carried.

A second motion was made, that a set of officers be elected to take office at the end of this two-day meeting. Seconded and carried.

Officers were elected as follows: Miss Ruth E. Coats, chairman; John Burch, vice-chairman, and Dr. Leo Hertlein, secretary-treasurer.

A motion was then passed that the chairman appoint a temporary secretary to make a record of this meeting and forward it to Dr. Hertlein. Dr. Keen thereupon appointed Mrs. Elsie Chace.

The meeting being open for discussion John Burch suggested that our next meeting be held during a school vacation, perhaps at Morro Bay. Dr. S. S. Berry moved that we add an executive committee of 4 members to the already elected group of officers and that it should always include the past chairman. Dr. Berry's motion was seconded by Mr. Smith and unanimously carried. Dr. W. O. Gregg suggested that the committee might suggest three places for each meeting and let the members choose by mail.

Nominations for this executive committee (also referred to as the Council) were then called for. Dr. S. S. Berry, Joshua Baily, A. Myra Keen and W. O. Gregg having been nominated from the floor it was moved that the nominations be closed. The four nominees were unanimously elected.

It was moved and seconded that we ask to be known as the American Malacological Union — Pacific Division. Motion carried.

It was moved, seconded and carried that we extend a vote of thanks to Dr. Irene McCulloch of the Hancock Foundation, Dr. A. Myra Keen of Stanford University and Mr. and Mrs. John Burch for their work in organizing this meeting.

It being now 11:20 a motion to adjourn was made, seconded and carried.

The next two hours were spent partly at a sociable luncheon in the U. S. C. Student Union to whose facilities Dr. McCulloch had arranged that we be admitted, and partly in getting a glimpse of the immense collections being worked on by the staff of the Foundation.

At 1:30 P. M. Dr. Keen called the afternoon meeting to order. The first paper was a brief one by Dr. McCulloch on "Material Collected By the Hancock Foundation." Probably very few of those present had ever realized what immense amounts of material had been collected by the Valero III, and the physical labor involved in sorting and caring for it, before scientific work could really begin — but we have had a glimpse now.

Next came a very interesting and scholarly paper by Dr. S. S. Berry titled: "A Survey and Natural History of Argonauta."

Mr. John Burch then read a paper by Dr. G. Dallas Hanna on "Indiscriminate Scattering of Exotic Mollusks." No abstract of this paper will be furnished this organization but it may be summed up in one word, "Don't."

Dr. Keen then presented a paper illustrated with lantern slides on "The Distribution of the Muricid Sub-Family Typhinae."

This subfamily of muricids numbers about 85 species, fossil and living. The group underwent progressive change from the Eocene to the present. The peculiarity of the whole group is a series of hollow tubes alternating with the usually spiny varices. Most species live in fairly deep water in the tropics. Hence, Typhinae are useful to the paleontologist as indicators of ecology even though they are never found in abundance. The genotype of one characteristic tropical American group, *Talityphis*, which was described without locality, is now known to occur in Santo Domingo and eastern Panama.

After looking over the material brought by the speakers to illustrate their papers the meeting adjourned.

At 7 o'clock Saturday evening the group gathered at Hotel Clark for dinner as arranged by Mrs. Burch. Following the precedent set by Mr. Sorensen and his hostesses at Pacific Grove there were corsages for the ladies present, camellias having been furnished by Mrs. Turver and Mrs. Chace. Dr. Keen presided and

John Burch acted as toastmaster. Dr. Irene McCulloch and Mrs. Burch were elected honorary members and greetings from Dr. Durham of the Paleontology Department of the University of California were read. Mr. A. M. Strong was called on as the first speaker and reminded us how recently malacology and ecology have become a part of our hobby. Following Mr. Strong's brief remarks each guest was introduced, but no long speeches were made and the group dissolved into interesting and informative general conversation.

The Sunday meetings were held at the Los Angeles County Museum. Dr. Keen called us to order at 10 A. M.

The first paper was titled "Studies on the Marine Gastropod Family Cancellariidae." It was submitted by Jay Marks and read by Mr. E. L. Hamilton.

Included in Mr. Marks' paper were two interesting statements — that one-fourth of the known Cancellarias are from the West Coast of the Americas, and (2) that Cancellarias are among the most abundant gastropods in the miocene of Ecuador and north to Costa Rica.

Twenty-seven generic, subgeneric, and sectional names are available for about 120 species of living Cancellariidae. Fifty-two names are available for fossil and living species combined. Modern Cancellariidae spring from a great number of races that were already highly differentiated in Miocene time. A true phylogenetic classification of the many units may evolve eventually if careful studies are made of the nuclear whorls, attention is paid to ontogenesis, and consideration given to the fossil species. Three groups of Cancellariidae are generally recognized: *Cancellaria*, *Trigonostoma*, and *Admete*. Recent studies of the nucleus and early spire whorls show that there are real differences between the three groups. Of the 27 supra-specific names available for living species, eight are represented by genotypes that are West American species.

Mr. H. H. Patten then showed some very interesting slides (and moving pictures) of a recent trip to Guaymas, Mexico. We got a clear idea of the country, and some of the collecting spots visited by the conchological group which gathered there last December.

Mr. Ernest Wilcox then gave us a short talk on a "Fossil Deposit Near Atascaders." He described it as a "Chalk Hill" near Santa Margarita. Its dominant forms were apparently oysters, Hinnites and Pecten. An attempt was made at one time to work it commercially for chicken grit, but was unsuccessful. At the close of Mr. Wilcox's remarks there was general discussion which quickly switched to the late Hilltop Quarry — now mostly buried under a housing project but sometimes accessible in a nearby gully.

Dr. Berry made the interesting statement that he had or knew of 500 different fossils from that deposit. Other speakers on the subject were Mrs. Clark, John Burch, George Kanakoff and E. P. Chace.

Dr. Keen's paper on "Introduced Mollusks Now Living in the San Francisco Bay Area" was the next on the program.

San Francisco Bay is now largely populated by East American and Japanese species. The latest immigrant to have become established is *Busycon canaliculatum* (Say), from the Atlantic.

A Japanese clam variously known as *Tapes variegata* and/or *T. philippinarum* is now abundant near San Mateo. Taxonomic study shows that this clam is the *Tapes semidecussata* Reeve, a species that should be recognized as distinct from either *T. variegata* or *T. philippinarum*.

Another oriental immigrant, *Corbicula fluminea*, abundant in the rivers that empty into San Francisco Bay, near Stockton, is extremely hardy. Two specimens kept in a quart jar of pond water in the laboratory at Stanford, have survived for over a year with only a single change of water.

After Dr. Keen's paper the group adjourned to the next room where Mrs. Burch had arranged a delicious luncheon.

The afternoon session began with some remarks by Mr. Smith on the recently received volume on the "Land Mollusca of North America" by Dr. H. A. Pilsbry.

Mr. Smith did not have time to go into great detail on this final volume of Dr. Pilsbry's gigantic work but a faint suggestion of the work that has been done in this field may be found in one little set of figures presented by Mr. Smith: Amos Binney's work in 1852 covered 128 species; Binney and Bland in 1858, 269 species and 29 subspecies; W. G. Binney in 1892, 335 species and 50 subspecies, and Pilsbry in 1947, 719 species and 416 subspecies.

Attention was also called to the fact that Dr. Pilsbry had no Californian records for *Cionella* (formerly *Cochlicopa*) *lubrica* (Müll.). It has been taken on Grizzly Peak back of Berkeley by Josiah Keep and A. G. Smith, on Clark Mountain, San Bernardino County by S. S. Berry, and in the Feather River Canyon, Plumas County by E. P. Chace.

Dr. Gregg discussed briefly some other portions of this book. It was then moved, seconded and carried that our organization send Dr. Pilsbry a letter of commendation on his work.

Dr. S. S. Berry then presented a brief paper on "The Holotype of *Murex petri*, Dall." This was a careful recapitulation of the very confused naming of the dredged trialate murices of Southern California. It seems to be established that we must discard the name *M. petri*, and for the present we shall probably use *M. rhyssa*.

This concluded the program for the meeting. It was moved, seconded and carried that the secretary write Mr. Sorenson saying how much the group regretted he could not be with us, and then a motion to adjourn was made, seconded and carried.

Later the group gathered on the lawn near the building and Dr. Berry took pictures. No report has been received on his success.

Respectfully submitted,

Elsie M. Chace,  
Secretary, *pro tem.*

Pacific Division of the American Malacological  
Union will hold its Second Annual Meeting at  
Long Beach, California, June 10, 11, 12, 1949.

## **NOTES AND NEWS**

Dr. Henry A. Pilsbry is recovering nicely from injuries suffered December 8, 1948 when he was struck by an automobile while crossing the street on the eve of his 86th birthday. Two bones in his left foot were fractured, but he was otherwise uninjured.

Edmund W. Twenhoefel of Belleville, Ill., has been elected to membership in the Malacological Club of London, England. Congratulations.

New York City conchologists are organizing a shell club there. If you have not been contacted and are interested, you should communicate with Morris K. Jacobson, 455 B 139 St., Rockaway, N. Y.

Harry E. Wheeler is now director of the Museum of the Cherokee Indian, Cherokee, N. C. This is a constructive, educational, recreational and scientific institution featuring the archeological, historical and cultural interests of the Cherokee Indians where Mr. Wheeler's talent for friendliness will be a valuable asset. Mrs. Wheeler is Assistant Director and an able partner of her husband in this worthwhile work.

Letters from Calvin Goodrich from Black Mountain, N. C., give a picture of serene living in quiet environment where, unfortunately, mollusks are not too plentiful.

The Rev. Paul D. Ford of Sunbury, Pa. and Nassau, Bahamas, is at present minister of the Central Baptist Church of Erie, Pa. The Conchological Section of the Buffalo Society of Natural Sciences is fortunate in being within visiting distance of Erie and will have the pleasure of hearing him speak at the meeting of the Section on February 5th. His topic will be "How to Study Your Shells."

### **CLIFFORD L. BLAKESLEE**

It is with deepest sorrow that we report the death on January 23, 1949, of Clifford Lyman Blakeslee, at Pittsford, N. Y. Mr. Blakeslee was known to many of our members through exchange and correspondence. By the magic of his skillful treatment the most commonplace of shells was transformed into a gem, and his letters were witty and bright with fascinating accounts of collecting experiences and observations. Several of his articles on collecting have been published in *The Nautilus*. He was also co-author with Imogene C. S. Robertson of "The Mollusca of the Niagara Frontier Region" published last summer by the Buffalo Society of Natural Sciences.

Always an active business man, assistant cashier and an officer in the Federal Reserve Bank of Buffalo, his retirement in 1938 at the age of 65 would have been unwelcome had it not been that it gave him more time to devote to the building up of his shell collection commenced in 1934. Working indefatigably and joyfully at this task he had amassed a most complete series of local species. In addition to these he collected in Florida and New England and by exchange augmented his large collection of marine species with specimens from all parts of the world.

### **RUSSELL GRAY**

Mrs. Anne Gray Hackney reports the death of her father, Russell Gray, on December 8, in Norfolk, Va., where he had been living with his daughter since his retirement in 1947. Only a few weeks before his death he had spent an afternoon digging miocene fossils from the cliffs at Yorktown, Va.

## ACTIVE MEMBERS

- Abbott, R. Tucker, U. S. National Museum, Washington 25, D. C.  
Aldrich Museum, 12 Bay Island Club, Balboa, Cal. Conch., mineralogy exch.  
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Andrews, Mrs. James N., Somerset, Va.  
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Baker, Edward Perin, 11619 Downey Ave., Downey, Cal. Pacific coast marine life  
Baker, Dr. and Mrs. Horace B., Zoological Lab., Univ. of Penn., 38th St. and Woodland Ave., Philadelphia, Pa. Res. 11 Chelten Rd., Havertown, Pa.  
Balch, Prof. Francis N., 130 Prince St., Jamaica Plain, Mass.  
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Bayer, Frederick M., Div. of Marine Invert., U. S. Nat'l Museum, Washington 25, D. C.  
Beatty, George D., R 1, Sandusky, O.  
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Berry, Dr. and Mrs. Elmer G., National Institute of Health, Bethesda, Md.  
Bippus, Alvin C., Jr., 1918 Bayard Pl., Toledo 6, O. Col. Marine univalves.  
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Brand, Dr. Donald D., Dept. of Geog., Univ. of Mich., Ann Arbor, Mich. Latin Am. land shells.  
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Camman, A. F., 515 N. E. Sixth St., Box 203, Ft. Lauderdale, Fla. *Liguus*.  
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Cheever, John Alden, 47 W. Cedar St., Boston 14, Mass.  
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Church, Austin, 165 George St., Trenton, Mich. P. O. Drawer C.  
Ciarla, Otello, Rua Augusta 91, Rio de Janeiro, Brazil. Local and foreign shells; books.  
Claar, Elmer A., 617 Thornwood Lane, Northfield, Ill. Coll. *Cypraea*.  
Clarke, Mrs. Effie M., P. O. Box 511, Yuba City, Cal.  
Clench, William J., Curator of Mollusks, Mus. of Comp. Zool., Cambridge, Mass. Coll., exch., buy.  
Coats, Mrs. Emma W., 702 E. First St., Tillamook, Ore.  
Coats, Ruth E., 702 E. First St., Tillamook, Ore. Exch. f.w. and Puget Sd. marines.  
Cockerill, Mrs. Lilius F., Sanibel, Fla.  
Colitz, Mrs. Samuel, 15 Capwell Ave., Pawtucket, R. I. Oct. to June, Box 1084, Hollywood, Fla.  
Cooke, Dr. Montague, Jr., Kualii, 2859 Manoa Rd., Honolulu 54, T. H.  
Corbett, William Phelps, 185 Grove St., Plainfield, N. J. Exch. rare *Cypraea*, *Murex* and *Oliva*.  
Cram, Dr. Eloise B., Federal Security Agency, U. S. Public Health Service, National Inst. of Health, Bethesda, Md.  
Crosby, William, San Mateo, Fla.  
  
Damron, Mr. and Mrs. Michael C. E., 29-D Venetian Way, Miami Beach, Fla.  
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Diaz, Dra. Amy E. Aguilar, San Benigno, No. 504 Altos, Santos Suarez, Habana, Cuba.  
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- Entwistle, Mrs. H. F., 49 Beech St., Nutley, N. J.
- Etter, Mrs. Georgia M., 2525 Euclid Ave., Cleveland, Ohio. Land and marines.
- Eyerdam, Walter J., 7531 19th Ave. N.E., Seattle 5, Wash.
- Fargo, William G., 506 Union St., Jackson, Mich. Dec. to May, P. O. Box 874,  
Pass-a-Grille, Fla. Tertiary mollusca.
- Fletcher, Mr. and Mrs. Howard L., 908 Crescent Ave. B, Redlands, Cal.
- Flipse, Mr. and Mrs. Robert C., 80-56 Surrey Place, Jamaica 3, N. Y.
- Ford, Rev. Paul D., Box 924, Nassau, Bahamas, B. W. I.
- Foster, Richard Winslow, Museum of Comp. Zool., Cambridge, Mass.
- Fox, Ralph Olen, 1048 Monterey Ave., Berkeley 6, Cal.
- Frampton, Mr. and Mrs. Henry G., Box 1052, Miami 6, Fla.
- Franzen, Dorothea, Dept. of Biol., Washburn Municipal Univ., Topeka, Kan.
- Gardner, Dr. Julia, U. S. Geological Survey, Washington, D. C.
- Gaylord, Joseph S., East Longmeadow, Mass.
- George, Mrs. Henry Jr., 7320 Watson Ave., Wauwatosa 13, Wis.
- Getz, Miss Dorothy, 5107 Roland Ave., Baltimore 10, Md.
- Gifford, Dr. and Mrs., E. F., 2535 Le Conte Ave., Berkeley, Cal
- Gillham, Bert A., Rockford, Iowa. Exch. local land and fresh water shells.
- Gilmore, Howard, 97 Holland Rd., Brookline, Mass.
- Goodrich, Calvin, Museum of Zoology, Univ. of Mich., Ann Arbor, Mich.
- Gordon, Mackenzie, Jr., U. S. Geol. Survey, Washington 25, D. C. West Am. mollusca.
- Goto, Masaichi, 1868 Palolo Ave., Honolulu, T. H. Hawaiian marines.
- Gould, Russell, 608 Cumberland Ave., Syracuse, N. Y.
- Grabie, Mrs. A. J., Box 611, Amityville, N. Y. Coll. and exch. Florida shells.
- Grant, Dr. U. S. 4th, 405 Hilgard Ave., Los Angeles 24, Cal.
- Gregg, Dr. Wendell O., 2200 S. Harvard Blvd., Los Angeles 7, Cal. Coll. and exch.  
mollusca of western N. A.
- Haas, Capt. Arthur, 3511 Second Ave. S., St. Petersburg 7, Fla.
- Haas, Dr. Fritz, Chicago Museum of Natural History, Chicago, Ill.
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- Hadley, Mr. and Mrs. F. K., Box 33, West Newton, 65, Mass.
- Hall, Henry Martyn Jr., 502 Lloyd St., Pittsburgh 8, Pa.
- Hamilton, Edwin Lee, Bldg. 315, Apt. 14, Stanford Village, Stanford, Cal. Marine  
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- Hammerschlag, Max G., 325 Grove Rd., S. Orange, N. J.
- Hanna, Dr. G. Dallas, California Academy of Science, San Francisco, Cal.
- Harbison, Miss Anne, The Barclay, Rittenhouse Square, Philadelphia 3, Pa.
- Harrington, George L., 566 Washington Ave., Palo Alto, Cal.
- Harris, Mrs. Edward O., 711 S. Fancher Ave., Mt. Pleasant, Mich.
- Harris, Dr. G. D., Research Institution, 126 Kelvin Pl., Ithaca, N. Y.
- Harris, Wray, Bernice P. Bishop Museum, Honolulu 35, T. H.
- Harry, Harold W., Museum of Zoology, Ann Arbor, Mich.
- Hartman, H. H., Frankfort, Kan. Worldwide marines and trop. land shells.
- Hastings, J. K., 239 70th St., Niagara Falls, N. Y.
- Hazlewood, Mrs. G. W., 102 S. W. Fifth Ave., Mineral Wells, Tex.
- Heath, Dr. Harold, 181 Ocean View, Pacific Grove, Cal.
- Hebert, Clyde H., 411 W. 62 St., Jacksonville, Fla.
- Heilman, Robert A., 360 N. Fifth St., Lebanon, Pa. Fresh water gastropods.
- Henderson, Miss Jennie, Elkhart, Iowa.
- Henderson, Mrs. Junius, 563 N. Marengo Ave., Pasadena, Cal.
- Herrington, Robert E., 208 9th St., Lorain, Ohio.
- Hertlein, Dr. Leo G., California Academy of Science, San Francisco 18, Cal. Pelecypoda.

- Hill, Dr. Howard R., Los Angeles Museum, Los Angeles 7, Cal.  
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Hoffman, Mrs. Fred St. John, 390 Depew Ave., Buffalo, N. Y. Exchange.  
Hollister, Dean S. C., College of Engineering, Ithaca, N. Y.  
Holmes, Charles H., 8 1/2 St. Bernard St., Saranac Lake, N. Y.  
Hoover, John Edgar, Washington 25, D. C..  
Horstman, Mr. and Mrs. Ralph Emerson, 208 N. Luzerne Ave., Baltimore 24, Md.  
Hudgings, Judy, Beal-Maltbie Shell Museum, Winter Park, Fla. Fla. shells.  
Hughes, Thomas, Route 2, Fort Pierce, Fla.  
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Ingram, Dr. William Marcus, Dept. of Zoology, Mills College, Oakland 13, Cal.  
Ishikawa, Margaret H., D. A. C.; ESS/ST GHQ FEC APO 500, c/o Postmaster, San Francisco, Cal.  
Jackson, Ralph W., Route 1, Cambridge, Md. Coll. and exch.  
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Jacobs, Dr. Walter H., 124 West 93 st., New York 25, N. Y.  
Jacobson, Morris K., 455 B 139 St., Rockaway, N. Y. East Coast mollusca.  
Jeffries, Frank L., 24 Rhode Island Ave., Washington, D.C.  
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Johnson, Richard I., 41 Bow Rd., Belmont, Mass. Coll., exch.  
Johnson, W. G., 47 Shore Front, Milford, Conn. and 921 24th Ave. N., St. Petersburg, Fla.  
Jones, Dr. David T., Asst. Prof. of Physiology, Miami Univ., Oxford, O. Res. 818 E. Fifth St., Vinton, Iowa.  
Kanakoff, George P., Los Angeles County Museum, Exposition Park, Los Angeles 7, Cal.  
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# THE AMERICAN MALACOLOGICAL UNION

## CONSTITUTION ADOPTED 1931

1. This society shall be called "The American Malacological Union."
2. Its object shall be the promotion of the science of malacology by holding meetings for reading and discussion of papers, and for furthering the interests of students and collectors of shells by facilitating acquaintance and co-operation among the members.
3. Membership shall be limited to persons resident in the Americas and Hawaii. New members may be proposed by two members and balloted for by the Council. They shall pay an annual subscription (dues) of \$1.00. They will receive without other charge all notices, programs, lists of members, etc., issued by the Union.  
NOTE: In practice the Council ballots have been delegated to the Secretary.
4. The following officers shall be elected annually by ballot: President, Vice-President, two Secretaries and Treasurer.
5. The Union will be governed by a council consisting of the officers and four other members to be elected annually by ballot.
6. The annual meeting shall be held at such time and place as may be fixed by the preceding annual meeting. Other meetings may be called by the Council. Meetings of local branches may be held as such branches may determine.
7. Proposals for the alteration of this constitution when signed by five members and passed by the Council shall be acted upon at the next annual meeting. Concurrence of three-fourths of the ballots cast is necessary for any alteration.
8. The NAUTILUS is hereby designated as the official organ of the Union.

## RESOLUTIONS

That there be an honorary membership for such as have contributed in an outstanding way to American conchology.—Adopted May 26, 1932. (The late Charles Torrey Simpson, Bryant Walker, and Victor Sterki were honorary members).

That there be a corresponding membership for those not resident in the Americas.—Adopted May 26, 1932.

That the Council shall consist of the officers, honorary and past presidents, and members at large not to exceed four. Members of the Council present at any annual meeting shall constitute a quorum.—Adopted August 3, 1937.

That the Chairman of the Pacific Coast Branch be a Second Vice-President.—Adopted August 26, 1948.

# THE AMERICAN MALACOLOGICAL UNION

## MEMBERSHIP

Membership in the American Malacological Union is open to anyone interested in the study or collection of shells. The annual dues are one dollar. There is no initiation fee. For further information, address the Secretary, Mrs. Imogene C. Robertson, 136 Buffum Street, Buffalo 10, New York. For the convenience of applicants for membership an application blank is given below, but its use is not mandatory.

## OFFICIAL ORGAN

The official organ of the Union is the *NAUTILUS*, a quarterly devoted to the interests of conchologists. Editors and Publishers: Henry A. Pilsbry, Curator of the Department of Mollusks, Academy of Natural Sciences, Philadelphia, and H. Burroughs Baker, Professor of Zoology, University of Pennsylvania, 38th Street and Woodland Avenue, Philadelphia. Subscription to the *Nautilus* is \$2.00 per year (\$2.15 to foreign countries) 50c a copy.

## MEETINGS

Since its foundation, the Union has met once a year in a place chosen by the membership at large. Meetings were suspended during the war and resumed in 1946.

## PUBLICATIONS

The Union publishes annually its "News Bulletin and Annual Report" which is printed in uniform size with the *NAUTILUS* and may be bound with it if desired. The Annual Report contains accounts of the Annual Meetings, a list of members of the Union, and obituaries of prominent members deceased during the year. In addition, the Union has published the following biographic and bibliographic memoirs:

Scientific Contributions made from 1882 to 1939 by Henry A. Pilsbry, Sc. D. 63 pages, 1940. 50 cents a copy.

A Bibliography and short biographical sketch of William Healy Dall. By Paul Bartsch, Harald Alfred Rehder, and Beulah E. Shields. Smithsonian Miscell. Coll. vol. 104, no. 15, 96 pp., portrait. (Published in large part from fund contributed by the American Malacological Union.) 50 cents a copy.

Annual Report of Meeting in 1941 with Symposium papers on Methods of Collecting and Preserving Mollusks. 50 cents a copy.

## Application for Membership in the American Malacological Union Dues are one dollar (\$1.00) per annum

Date \_\_\_\_\_

To the Secretary,  
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I hereby apply for membership in the American Malacological Union

Name \_\_\_\_\_

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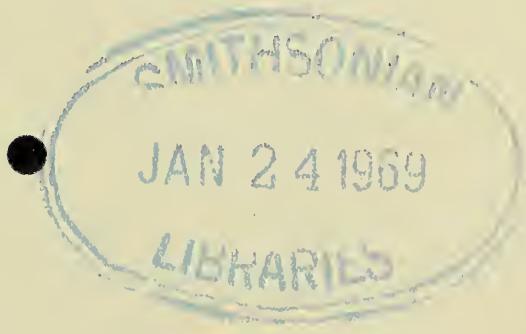
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The American  
*Malacological Union*

News Bulletin

and Annual Report • 1949



Membership List Revised,  
November, 1949

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# THE AMERICAN MALACOLOGICAL UNION

## FIFTEENTH ANNUAL MEETING

### MIAMI, FLORIDA, JUNE 16 TO 18, 1949

The American Malacological Union invaded the deep South for the fifteenth annual meeting; June 16 through 18 the time, the University of Miami at Coral Gables, Florida, the place. The date had been selected as the most convenient for the University, since then the regular college term had just ended, while the summer session was not yet under way.

With true Southern hospitality, the University put all of its facilities at the disposal of the group, first and perhaps most important being the use of spacious dormitories as sleeping units. These were in most cases the two-bedroom apartments regularly used by married students and their families, complete even to study lamps and cooking utensils. The entire arrangement was most convenient and made for a minimum of crowding. In fact the keynote of the dormitories, the campus, the University itself, is "great open spaces." Since Miami University is a comparatively new college, (chartered in 1925) the traditional ivied halls are in this instance represented by structures as modern as tomorrow.

The beautiful lounge in the Student's Club was assigned for the registration period which occupied the time until noon on Wednesday. As is usual, a few enthusiasts were on hand the night before the regular convention opened, hence the earliest morning arrivals found old friends waiting to greet them.

Though food was procured in the cafeteria, the Faculty Dining Room was reserved for the use of the group. As is the rule at these meetings, each meal was a social event, as replete with discussion as with food. It was a considerable "hike" from the dining room to the assigned meeting place, the air-conditioned reading room of the Library, and some of these enforced walks were made brisk by showers, while at other times the hot sun made strolling the preferred pace.

All in all, however, the Florida weather gave little cause for complaint. Although the rainy season was well along, only one really drenching shower fell during the daytime, and the famous Florida trade winds made sleeping easy.

At 2 o'clock Thursday afternoon President Elmer G. Berry called the meeting to order and introduced Dr. Charles Doren Tharp, Dean of the College of Liberal Arts, who made a gracious welcoming address. He placed the facilities of the University at the disposal of the A.M.U. and issued a blanket invitation to visit such laboratories and museum exhibits as might be of interest. Apologizing for the lack of a prepared program, he explained that he had understood that such arrangements were made within the organization, adding that any aid that he or his staff might be able to render was only to be requested. A boat trip to the reefs was being planned, but since the boat to be used could accommodate but fifteen at the most, he suggested that arrangements be made accordingly.

Dr. Berry, replying to Dean Tharp, thanked him in behalf of the A.M.U. for the gracious hospitality already so ably manifest, and assured him that the group is far from being a stilted, formal organization, and needs no charted pattern for a successful meeting. He explained that due to the illness of Mr. Harold Robertson, Secretary Imogene Robertson was unable to be present; he therefore appointed Margaret Teare and Margaret Teskey to act in her place; Mrs. Teare to attend to arrangements for the annual dinner, field trips, etc.; Mrs. Teskey to take the minutes of the meeting.

At this time the reports of the treasurer and secretary, Mr. and Mrs. Harold R. Robertson respectively, were read and accepted.

Dr. Carlos G. Aguayo presented the first paper, an abstract of which follows.

## MALACOLOGY AND THE OFFICIAL LIST OF GENERIC NAMES<sup>1</sup>

C. G. AGUAYO

(Abstract)

Having been requested to publish a Spanish edition of the International Rules of Zoological Nomenclature as well as of the Summaries of Opinions, I have noticed, the scant number of generic names of Mollusks in the "Official List of Generic Names." Indeed, only 29 names have been accepted and only 25 Opinions refer to Malacology among the 194 examined by us. This reduced number stands out the more sharply when compared with those accepted in other less numerous zoological groups.

According to Schilder, there are more than 450,000 species of mollusks known, (including fossils), with more than 11,000 genera, which shows that only insects outnumber them from the quantitative point of view. In spite of this, students of various groups have given more attention to the fixing of their generic names than malacologists. Thus, mammals are represented by 60 genera in the Official List; birds by 109; fishes by 56; crustaceans by 177, though not one of these groups comes even to 10% of the total number of the species of mollusks.

These data do not mean that Systematic Malacology is more stabilized than the other branches of zoology; on the contrary, perhaps it is one of the most entangled owing to the brevity of old descriptions, to the extensive literature, and to the ambiguity of many generic names. All this has often been evident by the large number of genera whose status is very doubtful because of the many homonyms and synonyms, some of which are accepted by malacologists of this or the other school while rejected by others. Systematic is an instrument for work both scientific and practical, which should tend chiefly to attain uniformity in nomenclature and also to stabilize names. On tackling the arduous problem of priority, we should bear in mind that in case of disagreement between priority and stability, the latter should have preference. The number of conflicts of this nature is, as we all know, really astounding and for this very reason it is strange how little interest we malacologists have shown in bringing to the attention of the International Commission the principal cases in which there are doubts about the strict application of the Code, as well as its suspension in benefit of the stability of nomenclature.

Since Dr. Aguayo had prefaced his paper with an apology for what he termed "his halting English," Dr. Berry commented that he personally would be happy to have as good a command of Spanish.

At the conclusion of the paper Dr. Aguayo suggested that the A. M. U. name a committee who would study the cases needing an urgent revision that come to their hands, and send them to the International Commission now at London.

A request for comment brought forth the following:

Dr. Paul Bartsch: "We do have a committee set up within the A. M. U. to pass on such problems and, if necessary, to refer them to the International Commission on Nomenclature in London. Dr. Pilsbry is president of this group, and other members are, Dr. H. B. Baker, Mr. William J. Clench, and Dr. Harald Rehder. But I personally think that it is too seldom called upon."

<sup>1</sup>This paper appears in full in *The Nautilus*, July, 1949.

Dr. Henry Pilsbry: "I have used this committee often."

Dr. Aguayo: "Then I wish at this point, to suggest that the members of the A. M. U. use their committee on nomenclature, not allow it to die of disuse."

Dr. Berry asked for a motion that Dr. Aguayo be elected a member of this committee. Dr. Bartsch so moved. It was seconded and carried.

The next paper was by Dr. Paul Bartsch, entitled "Synopsis of the Cuban Urocoptid Mollusks belonging to the Sub-families Macroceramus and Microceramus." His paper was supplemented by several elaborate charts illustrating series of the genus *Urocoptis* together with photographic figures of the species and subspecies embraced. He concluded by remarking that the monograph of the Cuban members of this immense family has been finished and will be ready for publication as soon as the introduction is completed. There are about 1700 pages of manuscript.

"Some Kodachromes of Live *Achatina fulica*," by Mr. William J. Clench, was presented next. Mr. Clench accompanied the slides depicting this molluscan pest in several stages of growth and activity with running comments. He remarked that the U. S. Navy had last year appropriated several thousands of dollars toward control and possible elimination of this problem, and had sent an entomologist, Dr. F. X. Williams, to Africa to discover a possible insect parasite. Such an insect has been found, but to date little has been done to develop the control program along this line. Mr. Clench said that for his part, he hoped that nothing would come of it. "It is much too risky to thus upset the balance of nature," said he, "and it is not often that one mistake justifies another. I am of the opinion that the most practical solution lies in the establishment of canning factories to prepare these snails for animal food, perhaps also for human consumption." The photographs shown were of specimens collected by Dr. Williams in Tanganyika.

In response to Dr. Bartsch's query as to when *Achatina fulica* was introduced into the Philippines, Mr. Clench said that the introduction and subsequent alarming spread of this snail on the Pacific islands occurred during the early part of the war, though in some cases perhaps prior to that period, and that they are now becoming a real menace to the Hawaiian Islands.

Mr. Ted Dranga made this observation: "About Hawaii—the Japs got permits to keep these snails in cages as pets, but the young passed the bars and escaped. When they began to be a real threat, convicts were sent to infested regions to burn them off, but they merely waited in cracks in the ground until the fires were out. And now they are really getting to be a problem."

Dr. Van der Schalie: "I understand that a half million dollars has already been spent to fight them there."

Mr. Clench: "Tucker Abbott has an excellent paper on the subject."

Mr. MacMillan: "And I understand that chemicals have been used to fight them, but with little luck so far."

Dr. Berry's topic was: "Molluscacidal Experiments in Brownsville, Texas."

## MOLLUSCACIDAL EXPERIMENTS IN BROWNSVILLE, TEXAS E. G. BERRY

Schistosomiasis is one of the most widely spread and, in certain countries, the most debilitating of human tropical diseases. The larval stages of the trematode worms which cause this disease develop only within the tissues of certain species of snails. The most practical method of controlling the disease is by the elimination of the snail host. One of the several projects in the Laboratory of

Tropical Diseases at the National Institutes of Health is the screening of chemicals, mostly organic compounds, in the hope that a better molluscicide may be discovered.

From more than 400 chemicals tested in the laboratory on *Australorbis glabratu*s, the principal intermediate host of *Schistosoma mansoni* in the Western Hemisphere, ten of the most promising compounds were chosen for field trials which were conducted near Brownsville, Texas. This region was chosen primarily because of the abundance of *Tropicorbis obstructus donbilli*, a species related to *A. glabratu*s, which were present in the majority of roadside ditches and borrow pits.

Prior to spraying the chemical, population records were made of the various species of mollusks present. The chemical was applied at the rate of 10 parts per million by use of "Sure Shot" air pressure sprayers. Random inspection was made of the chemically treated area at 24-, 48-, and 60-hour intervals after spraying. Critical examination was made on the fourth day to determine the efficacy of the chemical.

Two of the ten compounds used, pentabromophenol and pentachlorophenol sodium salt monohydrate, proved to be good molluscicides. Both of these chemicals killed the majority of *Tropicorbis obstructus donbilli*, *Aplexa nitens*, and *Drepanotrema cultratum labrosum* within 24 hours. In the sample collections made prior to the fourth day not a single live specimen was found in the treated waters, nor were any live snails found within a distance of 6 feet beyond the sprayed area. On the fourth day when a systematic collection was made over the entire treated area only one snail, *T. obstrictus donbilli*, was found alive, and it is possible that this specimen had floated into the treated region.

Of the three species exposed to the chemical, *Aplexa nitens* was the most susceptible, whereas *Drepanotrema cultratum labrosum* was the most resistant. Answering a query he said that work is being done on a respiratory toxin, and that the World Health Association is also dealing with the problem, with perhaps the greatest obstacle being the ignorance of the peoples most in need of aid. As to the possible danger of infection from the Australian *Bulinas* being imported and sold to local aquariums as "red snails," such snails are not carriers, there being at present no fluke problem in either Australia or New Zealand.

Mr. Gordon K. MacMillan's paper, "The Occurrence of *Hendersonia Occulta* in Pennsylvania" was accompanied by slides depicting the habitat of this snail, ending with a scene that was quite familiar to a part of his audience; it was a snapshot from the field trip of the 1948 Convention, at which time a new record for *Hendersonia occulta* was established, when it was discovered on a sooty slope near Pittsburgh.

#### THE OCCURENCE OF *Hendersonia occulta* (SAY) IN PENNSYLVANIA GORDON K. MACMILLAN (Abstract)

During his sojourn in New Harmony, Indiana, Thomas Say discovered a new species of land snail in the ragged and abrupt "bluffs" along the Wabash River one half mile below the town. This shell he described in 1831 as *Helicina occulta*. One year later, Jacob Green, at that time the first Professor of Chemistry in Jefferson Medical College at Canonsburg, Pennsylvania, found the first living specimens of *Hendersonia occulta* in the rambling hills of Crafton not far from the mouth of Chartiers Creek. Jacob Green called his species *Helicina rubella*. At present *Hendersonia occulta* occurs at only eight localities in southwestern Pennsylvania in Allegheny, Greene, and Washington Counties. This species pre-

fers a limestone region as made by my observations and as attested by those of Prof. B. Shimek, Dr. H. B. Baker, Dr. J. P. E. Morrison, and Dr. H. A. Pilsbry. As also with the observations made by Prof. Shimek, *Hendersonia occulta* is closely associated with some stream. All of the localities in southwestern Pennsylvania fall within the drainage systems of the Allegheny, Monongahela, and Ohio Rivers, and occur along these rivers or some tributaries of them.

Yoshio Kondo's Biographical sketch of Dr. Montague Cooke, Jr., was read by Dr. H. B. Baker, and brought forth much comment from those who had their own personal recollections of this man.

## DR. CHARLES MONTAGUE COOKE, JR.<sup>2</sup>

YOSHIO KONDO

(Abstract)

Dr. Charles Montague Cooke, Jr. passed away on the afternoon of October 29, 1948, at the age of 73, after nearly four months' illness caused by a fall on the laboratory floor on July 1.

He was born in Honolulu on December 20, 1874. His father was a brilliant financial leader, while his grandfather, Amos Starr Cooke, was a missionary who founded the Royal School for the children of the chiefs of Honolulu. Dr. Cooke graduated from Yale in 1897 and received his doctorate in 1901. During his senior year he applied for a position in the Bishop Museum, but decided to do graduate work under A. E. Verrill.

It was on an expedition to Bermuda with Verrill that he met the future Mrs. Cooke, Eliza (Lila) Lefferts, of Brooklyn. They were married in 1901. In 1902, while on their honeymoon in Europe, Dr. Cooke received a cablegram notifying him of his appointment to the staff of the Bishop Museum as a general assistant.

In those early days the Museum had no department of mollusca, but did have the Andrew Garrett fine collection of Polynesian land and marine shells which William Healey Dall had studied, and the names and classification of which he had brought up to date. Dr. Cooke began collecting Hawaiian land shells immediately, making numerous expeditions to the other islands, paying attention to the minute shells as well as the large, usually in company with staff members like J. F. Stokes and C. N. Forbes, and also with non-professional conchologists and friends. Good roads and automobiles were absent in those days, and collectors depended largely on their feet for transportation, thinking nothing of tramping 30 miles to their collecting ground, with camping and collecting gear.

In trying to build up a collection he was hampered by the lack of adequate literature and accurately named specimens for comparison, so that he made a study trip to European and American museums in 1906 to study the widely scattered types of Hawaiian land shells. In order to fill the numerous gaps in the Bishop Museum shell literature he copied the unobtainable ones in longhand at the Philadelphia Academy of Natural Sciences.

Following this study trip he was appointed Curator of Pulmonata, a position he held with distinction for 41 years. Later he was appointed to the board of trustees of the Museum, and was its president at the time of his death.

He collected in the Hawaiian Islands very thoroughly and took part in, led, or directed from Honolulu, at least 16 large collecting expeditions to Polynesia and Micronesia. Of these the largest and most complete was the Mangarevan Expedition of 1934 in which he led a party of scientists in a converted tuna

<sup>2</sup>This paper appears in full in *The Nautilus*, July, 1949.

sampan in a six months' exploratory expedition into Eastern Polynesia, thus bringing to life a dream he had had for many years.

Eminent malacologists who should be mentioned in connection with Dr. Cooke because of his collaboration with them, are Dr. Henry A. Pilsbry, Dr. H. B. Baker, Henry E. Crampton, and William J. Clench. These names will always be associated with Cooke as each of them has contributed much toward the study of land shells of this area.

Dr. Pilsbry remarked that the Cooke collection is invaluable to the Bishop Museum. Of Dr. Cooke himself, Dr. Pilsbry said, "He was exceedingly likable and I remember his fish chowder with affection!" Mr. Dranga, who has done much collecting in the South Pacific for the Bishop Museum, said that he was impressed with Dr. Cooke's skill in cleaning minute shells: "I have seen him remove the animal complete for study from embryonic shells." Dr. Bartsch remarked that Dr. Cooke had taught him to collect tropical land shells; he recalled collecting *Achatinella* on tall trees, climbing with hands and feet and holding the precious shells in his mouth.

Mr. Clench's association with Dr. Cooke was initiated by correspondence in 1923. Real friendship started in 1933, when Dr. Cooke paid a visit to the Museum of Comparative Zoology to study the Hawaiian collections. Subsequent visits only deepened this friendship and later resulted in an opportunity to collaborate in a study of the mollusks in the Hawaiian Islands. Through the efforts of Dr. Cooke, a fellowship was made available so that Mr. Clench could study the collections of Pacific land Mollusks in the B. P. Bishop Museum. This was from October 1940 to April 1941. Mr. Clench spoke very feelingly of Dr. and Mrs. Cooke's kindness to him during his long stay in the islands.

The meeting was adjourned at this point, but the assemblage re-convened somewhat later for the Annual Dinner, which was served in the Faculty Dining Room. At the conclusion of a bounteous meal, Dr. Bartsch paid tribute to Dr. Henry Pilsbry, who as dean of American conchology, graces each of these affairs which he attends with his quiet simplicity. Dr. Pilsbry replied briefly, and then the group moved on to a beautiful room on the second floor.

Three movies were shown, depicting the activities of the Marine Biological Laboratories of the University of Miami. Dr. Charles E. Lane, who is in charge of this department, accompanied the scenes of dredging, shallow water collecting, closeups of mollusks, fishes, etc., with explanation and running comment; it was most interesting, and too soon over. And so, too, ended the first day of the convention.

Friday morning's session opened with a brief report of the council meeting, held the night before. The slate of nominated officers was presented as follows: President, Dr. Fritz Haas; Vice-President, Dr. Joseph P. E. Morrison; 2nd Vice-President, (Pres. A. M. U. P.) John Q. Burch, Treasurer, Harold R. Robertson; Secretary, Imogene C. Robertson; Councillors-at-Large, Dr. Carlos Aguayo, Dr. Joseph Bequaert, Dr. G. D. Hanna, Dr. Jeanne Schwengel. Capt. Arthur Haas moved that the panel be declared elected by popular vote, Dr. H. B. Stenzel seconded the motion, and Dr. Berry thereupon announced the election of the slate as read.

That no decision as to a meeting place for 1950 had been reached was announced; the matter will be taken up later within the Council, and the time and place announced.

Mrs. Lillias Cockerill displayed a part of her extensive shell collection via the medium of kodachrome slides, as well as a few views of her Sanibel garden. As she closed she remarked that once during a similar showing to a non-scientific

audience, one lady recognized a picture of *Mitra episcopalis* L, as a "red junonia" and insisted that she had collected the identical on Sanibel sands. And perhaps she had, for, as Mrs. Cockerill explained, during a disastrous hurricane several homes housing extensive collections were wrecked, scattering exotic shells to be "collected" later.

Dr. Henry van der Schalie spoke regarding the *Nautilus* index, a project upon which Dr. Aurele La Rocque, aided by the staff at the University of Michigan, has spent many months, and which is now virtually completed. A comprehensive report on the work done has been printed before, (A. M. U. Bulletin and Annual Report, 1947, p. 11, 1948, p. 6), and will not here be repeated; it was a monumental undertaking, carefully and painstakingly executed, and will be of inestimable value not only to those owning back copies of the magazine, but to any one who has need to refer thereto. The time is at hand when the problems attending publication, especially a plan of financing same, must be faced. Dr. La Rocque has labored long and unselfishly, and it is now the important privilege of other interested members of the A. M. U. to support any program which the Executive Council may devise. Individual monetary contributions have not been solicited, but will be gratefully accepted and should be sent to Dr. van der Schalie at the University Museums, Ann Arbor, Mich.

Dr. Luis Howell Rivero's paper on "Reproduction in *Caracolus sagemon* Beck, was read by Mr. Clench; and a jar of specimens in all stages of growth was put on display.

#### REPRODUCTION OF *Caracolus sagemon* BECK

LUIS HOWELL RIVERO

(Abstract)

A series of live snails, *Caracolus sagemon* Beck, were brought from Ventas de Casanova near Contramaestre, Oriente Province. These were kept alive in a box with very damp earth so as to study their habits and development. Description is briefly made of the general anatomy; detailed description is made of their genitalia.

*Genitalia.* Atrium with no verge nor stimulus, it divides in two; one followed by the penis with flagellum located dorsally to the penis; the other one followed into the vagina, its continuation, to end in a very narrow duct to the spermatheca. The oviduct opens into the vagina through the underside. The conductus deferentis goes under the vagina, atrium and penis to come upwards along the left side of the penis to the flagellum. Albumen gland located on the first part of the hepatopancreas and above it. Hermaphroditic duct long, with many circumvolutions; it ends in a narrow tape-like duct, which does not branch off in immature specimens, but branches repeatedly in sexually mature specimens. Hermaphroditic gland formed of many glomerules, united in one bunch in immature specimens, or scattered over the entire hepatopancreas in sexually mature specimens. Flagellum with spermatophore included in specimens ready for mating in mating it fixes itself with terminal hook on the opening to the oviduct, its body lying in the vagina, its spermatic packs emerging through the trough along one of its sides along its spatuliform posterior end and into the duct of the spermatheca. The empty spermatophore capsules are ejected.

In mating, the atrium, plus the vagina and penis are everted; the atrium to form a dough-nut like mass around the genital opening; the vagina forming a global projection with the spermatheca duct opening in its middle, the opening of the oviduct to one side; the penis thumb-like, with the flagellum opening towards its, and near its, end.

After 7 to 8 days of mating, the eggs are laid. To accomplish this the animal burrows itself and opens a cavity deep in the earth, where the eggs are laid, one at a time between short intervals, these in number from 8 to about 15 at a time; afterwards, the hole is filled up again with earth. The eggs require a great amount of humidity, otherwise they dry up by shrinking. After one batch of eggs is laid, and after 3 days, another mating takes place, one spermatophore capsule used in each time, and so on up to 8 matings and eggs laying. Therefore, to form a new spermatophore capsule, which is segregated by the flagellum walls, it takes from 10 to 13 days. The eggs hatch in about 7 to 8 days, the young ones hatching with  $1\frac{3}{4}$  turns on the shell with umbilicus well developed, this only lost upon the development of the peristoma after reaching sexual maturity, which is attained in about one year and a half. Only very early stages have been able to be observed, accordingly embryos of freshly laid eggs, 12 hour embryo and 48 hour embryo where studied. After 48 hours, the albuminous substance containing the embryos clouds up preventing observation by transparency of the membrane underlying the calcareous shell of the egg.

In these early stages, we have not seen the traditional macromeric or micromeric division of the early ovum; we have not seen the trochosphere-stage larva which is said to present itself in the pulmonated gasteropods, nor the velum of the veliger stages which is also said to be slightly developed in pulmonated gasteropods. The podocist is retained until hatched, and then eaten up by the young snail with the shell of the egg from which it was born.

They live and act lively during late evening and all night, to hide in dark places, or bury themselves during day time. Their greatest activity is in spring, summer and autumn, and among these, their most active period during the hot and humid summer months, when most of the mating and egg laying is done. They feed mostly on lettuce, which was preferred to any other vegetable.

Mr. Clench related his personal experience in collecting *Caracolus sagemon* in Cuba. At dawn they were plentiful, but as the sun came up every one disappeared into the ground. He said that more research is needed as to the maturity age of most land snails; therefore this paper is especially valuable. Dr. Bartsch remarked that though Dr. Dall used to believe that the wet season affected the maturity age of *Cerion*, in his own experiments in colonizing these snails on the Florida Keys it has required three years for the Bahama species to reach sexual maturity.

"Another Technique for the Preparation of Radulae" was a short talk by Dr. Henry van der Schalie. Dr. Berry observed that once while working under Dr. Hanna he had tried essentially the same technique as that suggested by Dr. van der Schalie but with somewhat different equipment.

Dr. Aguayo's second paper was then given.

#### INTRASPECIFIC UNITS IN MALACOLOGY

C. G. AGUAYO  
(Abstract)

To biologists, recurrent variations are quite different from isolated races or subspecies; while zoologists of the New School who have gradually cut loose from the strictly morphological systematics by adding facts offered by genetics, ecology, statistics, etc., agree that variations have different biological origins and should not be confused in scientific nomenclature.

When the term subspecies was introduced in the "Rules of Nomenclature," it was believed that problems related to intraspecific varieties were solved. Soon, however, it was evident that trinominal nomenclature could not express the observed differences. Some entomologists tried to surmount this by admitting a quadrinominal system to indicate colonies or populations slightly different from the typical forms.

But there are other variations co-existing in several populations of the same species which do not form independent colonies. These have not the same meaning as the said varieties of insects, nor of geographic races, and should not be named in similar manner. Some authors have used for them several names, but others consider all variations with the same nomenclature.

Geographic varieties, though little pronounced, may be considered subspecies, but non-isolated variations, though at times with marked morphological differences, should not receive the same type of nomenclature as the subspecies, for they lack the physical boundaries which create that reproductive isolation.

The fresh-water mollusk *Tropicorbis albicans* Pfr. shows two forms: one, without internal teeth, was described as *Pl. albicans*; the other, with several teeth, was later named by Gould *Pl. dentatus*. Both occur in nearly all populations in variable proportion, regardless of the size of the water body and of its ecological conditions. The name *Tropicorbis albicans* Gould does not seem to be the proper one for the later form, as it is not an isolated race. Perhaps the most suitable nomenclature would be for example: *Tropicorbis albicans* Pfr. form *dentata* Gould.

It is indeed very peculiar that all accept albinism, melanism, etc. as true mutations and no one thinks of giving them subspecific names. But if, for example, a mollusk with entirely yellow shell shows variations with the apex or the peristome of different color, there is a tendency to give them a distinct trinominal name. Is a spot on the apex, or a band on the peristome, originated by genetic changes, of greater importance than those producing the entire coloration? It seems hard to believe it.

In land snails, geographic races are common and the trinomia have for them their proper expression. But in marine animals isolation is not so common and geographic races are more difficult to understand. On the other hand, ecological variations are more frequent on account of the rapid phenotypic reaction to conditions of salt water. A good number of so-called subspecies of sea animals belong to the type of ecological races or simple mutations.

Though there is no sharp division between ecological and geographic varieties, as a rule, geographic subspecies are monophyletic, while ecological varieties are polyphyletic.

Some authors rightly think that for practical purposes, it is convenient to apply names to all variations occurring with relative frequency, because, as Pilsbry expresses: ". . . nomenclature and taxonomy are devices for helping us to comprehend the record the complicated relations of living beings . . ." This is absolutely true, as also that nomenclature is conventional and that the interpretation of facts shown by species and their variations is mainly subjective. But because of this subjective and conventional character, we should reach an agreement to fix the scope of some of the basal units of taxonomy and by all means, we should prevent Systematics from becoming a tower of Babel, where each naturalist speaks a different language. In view of this, there ought to be a regulation by which to limit each unit for the proper comparisons of the names proposed by different authors. The question is not whether we should or should not apply names to variations, but about the convenience of not confusing them with the subspecies.

Many zoologists have tried to solve the problem by proposing a quadri-nominal and even a quinquenominal nomenclature for which the following terms have been used: variety, microsubspecies, mutation, phases, cline, ecotype, paramorph, sibling species, etc.

It would be practical to select one or more of the proposed names and use it consistently in the nomenclature of infraspecific varieties — as Dr. Pilsbry has done for Florida *Liguus* — and to restrict the term subspecies exclusively for geographic races. The terminology of sympatric varieties could be expressed as follows: *Polymita picta picta* Born, form *muscata* Torre.

We do not fail to see the difficulties to be met in defining many perplexing cases in which it is hard to decide whether it is a subspecies, a sibling species, a cline, etc. But these troublesome groups are exceptions — a natural result of the continuous processes of speciation — and in most cases the animals studied could be placed in the categories of either allopatric or sympatric varieties.

Wires received during the morning were read at this time, the first from Dr. Fritz Haas expressing his regret at not being present at the convention, and sending his wishes for a most successful one. The second wire was from the Robertsons stating that Imogene and Harold were attending in spirit though not in person, and also relaying best wishes for the usual success of the convention.

After a hasty lunch and although a light rain made it uncomfortable some impromptu collecting was done in the scrub area near the cafeteria. Results were good, though discovery of a couple of scorpions made for caution and brought realization that "this is the south, Suh!" The lily pool in the Library patio came in for scrutiny, and several aquatic species were discovered there. Collecting equipment was conspicuous by its absence, but at least one zealot utilized a paper cup, then spent the entire afternoon session preventing the escape of the agile mollusks over the top.

On reconvening the first paper of the afternoon was by Dr. Joseph P. E. Morrison, read by Paul L. McGinty.

#### NOTES ON THE FLORIDA SPECIES OF BURSA

J. P. E. MORRISON  
(A condensation)

The Florida shells formerly called "Ranella" belong to the genus *Bursa* of Röding, 1798. There are four types or subgenera of *Bursa* known to live in the area.

Only one species of the subgenus *Tutufa* Jousseaume 1881 is known from the Atlantic Ocean. *Bursa (Tutufa) tenuisculpta* Dautzenberg & Fischer (Res. Camp. Sci. Monaco, part 32, p. 36, pl. 2, figs. 15-18: 1906) was originally described from Madeira and the Azores. The U. S. National Museum collections include specimens dredged in from 50 to 125 or more fathoms, from off Sand Key and off Key West, Florida; off Bahia Honda, Cuba; from North of the Virgin Islands; and from the Arrowsmith Bank, Yucatan. This species has been seen fossil from the Miocene of the Dominican Republic. The only published figure of a Florida specimen (USNM No. 417773) was recently included in Lyman's Shell Notes, Vol. 2, No. 6, p. 92, & plate, fig. 1, under the incorrect name *affinis*. Shells of this subgenus are not flattened from front to back in the typical *Bursa* fashion, but appear evenly rounded when viewed from the top. The varices on the spire marking former positions of the aperture are almost exactly spaced at each 2/3 whorl.

The subgenus *Bursa* (*sensu stricto*) is likewise represented by only one Atlantic species. *Bursa* (*Bursa*) *thomae* Orbigny (Sagra's Cuba, vol. 5, p. 250, pl. 23, fig. 23: 1846) is distinct from all of the ten species of the group known to be living in the Pacific. All the species of *Bursa* s. s. are separable on color of aperture and sculpture characteristics, and each one has a different geographic range, indicating different origins or survival areas in the process of speciation. The range of this furthest outlying member of the group fits the geographic picture, as the only one that got far enough east to enter the Atlantic. It is widespread in the Atlantic Ocean, however, and has been recorded from the Miocene of the Dominican Republic. The U. S. National Museum possesses only a few specimens from Florida; off Cape Roque, Brazil; St. Helena; and the Cape Verde Islands. A Florida specimen has been recently figured by Maxwell Smith (Triton, Helmet & Harp Shells, p. 27, pl. 9, fig. 2: 1948) under the incorrect name *rhodostoma*.

The subgenus *Bufonaria* Schumacher has only one representative in the Caribbean Region. This group is characterized by the peculiarities of the posterior siphonal canal which is closely appressed to the spire so there appears to be only one wall to this canal. The other wall is the surface of the penultimate whorl. *Bursa* (*Bufonaria*) *spadicea* Montfort 1810 is the fifth species of *Bursa*, most recently discovered in Florida waters. T. L. McGinty (Nautilus 54 (2) : 71 : 1940) recorded the species "— living in Lake Worth, at Boynton; one additional specimen was dredged from 30 fathoms." The U. S. National Museum collections include specimens with exact data only from Colon, Panama, and the Gulf of Paria, Trinidad. This species is decidedly flattened, rather oval, and smoothish or finely beaded in sculpture. It has been figured by Maxwell Smith (Triton, Helmet, and Harp Shells, pp. 24-25, pl. 9, figs. 8 and 10 : 1948) under the names *crassa* and *crassa caribbaea*. If the two-form variations of this species are distinct they must bear the names *spadicea* Montfort 1810 and *crassa* Dillwyn 1817, as the earliest names available for and based on each form. *Bursa* *spadicea* has been recorded as fossil in the Miocene strata of Jamaica, the Dominican Republic, Trinidad, Colombia, and Costa Rica, indicating its presence in the Caribbean without specific change since that time.

The subgenus *Colubrellina* Fischer 1884 includes two other Florida species of *Bursa*. They have often been confused and synonymised, and have been given several specific names apiece, because their great variability of shell sculpture occurrence in widely separated localities has not often been examined as part of one larger zoogeographic picture. One species is correctly known as *Bursa* (*Colubrellina*) *granularis* Roding 1798. Its synonyms include *elegans* and *rubicola* of Perry 1811; *granifera* and *semigranosa* Lamarck 1822; *affinis* Broderip 1832; *livida* Reeve 1844; and *cumingiana* Dunker 1862, from the Indo-Pacific Region, and also *cubaniana* Orbigny 1846, from the West Atlantic Region. The geographic story of *Bursa granularis* is interesting. It is living all the way across the Indian and Pacific Oceans from Natal, South Africa, to the Ryukyu and the Hawaiian Islands, and from New Caledonia to Clarion and Clipperton Islands off the west coast of Mexico, as well as in the Caribbean Region. It has not yet been recorded from the west coast of tropical America. Also, the presence of this species on the eastern shores of the Atlantic needs confirmation. The shells seen from Florida, the Bahamas, Cuba, Jamaica, St. Thomas, and Barbadoes, are not distinguishable from Pacific specimens. In other words, *granularis* reached the Antillean Region before the Central American Isthmus was finally raised as a complete land barrier between the tropical Atlantic and Pacific Oceans. These variable shells have not changed enough since that time (Miocene) in either

Ocean to be radically separated. Florida specimens are figured in Lyman's Shell Notes, vol. 2, No. 6, p. 92, plate, figs. 2, 3, and 4 (bottom), under the name of *cubaniana*.

The other Florida species of this group is correctly known as *Bursa (Colubrellina) corrugata* Perry 1811. Its synonyms include *caelata* Broderip 1832; *albofasciata* Sowerby 1841; *ponderosa* and *pustulosa* Reeve 1844; and *caelata louisa* Maxwell Smith 1948. Its present geographic range is known to include the West Coast of America (East Pacific) from Lower California to Ecuador, and the Atlantic Ocean between Florida, Brazil, St. Helena, and the Cape Verde Islands. We have not seen specimens from the last locality, which is reliably reported in the literature. As in the case of *granularis*, the species *corrugata* was living on both sides of America before the Isthmus became a complete land barrier, and has not changed shell characters specifically since that time. The age of this species is also confirmed by its presence in Miocene strata of the Dominican Republic and of Northern Venezuela. A Florida specimen was recently figured in Lyman's Shell Notes, vol. 2, No. 4, cover, and p. 40, under the name of *ponderosa*.

It is hoped that the following key will effectively separate the Florida species of *Bursa*.

#### A KEY TO THE FLORIDA SPECIES OF BURSA

- A. Shell round in apical view;  
Varices 2/3 whorl apart,  
not coinciding on spire. .... (subgenus TUTUFA)  
*tenuisculpta* D. & F
- AA. Shell elliptic in apical view;  
Varices 1/2 whorl apart,  
coinciding on spire.
- B. Shell whitish;  
Aperture pink to purple. .... (subgenus BURSA, s. s.)  
*thomae* Orbigny.
- BB. Shell brownish;  
Aperture white to brownish.
- C. Posterior siphonal canal  
appressed to spire, not  
parietally separate .... (subgenus BUFONARIA)  
*spadicea* Montfort.
- CC. Posterior siphonal canal not  
appressed to spire, its  
parietal wall separate .... (subgenus COLUBRELLINA)
- D. Sculpture finer; Varices  
not sharply crimped or  
pitted; Mature lip narrower,  
usually whitish except on  
columella. .... *granularis* Röding.
- DD. Sculpture coarser; Varices  
sharply crimped and pitted  
front and back; Mature lip  
broadly reflected, generally  
brownish. .... *corrugata* Perry.

To summarize from the genus *Bursa* and the Florida species in particular: Some of our marine shells are survivors over wide, previously continuous distribution areas. In the case of all five of these Florida Bursas we have proof that they are older, stable species, that have not changed as to shell characters since the Miocene geological period, when the geographic range of two of them was cut in two by the elevation of the Central American Isthmus to complete the equatorial separation of the Atlantic and Pacific Oceans.

"Collecting Boards for Teredo Studies," by William J. Clench, was accompanied by two kodachrome slides illustrating the favored types of test boards and collecting boards that are used to obtain various species of Teredinidae and other marine borers. These various test and collecting boards indicate the season, depth and intensity of attack at any given locality where they have been placed. Monthly examination of these tests not only furnish information regarding the borers but many other types of marine animals that grow upon them.

The speaker asked that any one in a position to do so make these tests and send the boards to his department at the Museum of Comparative Zoology at Cambridge. Shipworm control is of the very greatest economic importance and engages the attention of government agencies and private interests alike. Dr. Bartsch observed that he deplores the term, "Teredo Control," since teredo is but a generic name and not the only borer under consideration, adding, "I once saw three quarters of a mile of unprotected piling go in three months, and a quarter of a million dollars worth of mahogany was ruined in two months, lying in South American water awaiting shipment." "And I," said Mr. Clench, "saw Oregon pine, submerged at Midway for *one* month, that could be crumpled in the hand like paper!" Dr. Stenzel remarked that shipworm holes are common in calcified wood; Dr. Aguayo said that the wood of a certain Cuban tree is shipworm-proof to the degree that it is nearly extinct due to over-demand. "The very toxic green-heart tree of Panama," remarked Dr. Bartsch, "was once considered invulnerable to shipworm, but has since proved susceptible." In reply to Captain Haas' query as to whether the animal feeds on wood, Mr. Clench answered that there is a chance for argument on that subject; they live *in* the wood, he said, as a clam lives in sand, and may eat certain of the wood sugars, but the damage is caused by the burrows they make. Dr. Bartsch closed the discussion by saying that though we have no life history of the shipworm, the most complete information is to be found in "Johnsonia."

Dr. Isabel Perez Farfante's topic, "An Exhibition of Marine Mollusks from the Argentine," was accompanied by a display of the shells, with the tray being passed for inspection.

It was a great privilege to meet these eminent Cuban malacologists, Dr. Farfante and Dr. Aguayo, and since it has been hoped that Dr. Carlos de la Torre would be present also, the news of his illness and consequent inability to attend was disappointing indeed.

"Recent Investigations on Medical Malacology," by Dr. Berry, was the final presentation of the day.

#### RECENT INVESTIGATIONS IN MEDICAL MALACOLOGY E. G. BERRY

In the Laboratory of Tropical Diseases at the National Institutes of Health in Bethesda, Maryland, staff members in four distinct units are conducting research problems in which snails are used as experimental animals. In the Section on Helminthic Diseases various strains of two blood flukes of man, *Schistosoma mansoni* and *S. japonicum*, from several countries are being tested

to determine if snails of the same species, but from widely separated areas, e.g., *Australorbis glabratus* from Puerto Rico and Brazil, are capable of serving as intermediate hosts for the same strain of parasite. These experiments have indicated that *A. glabratus* from Brazil is physiologically distinct from the Puerto Rican *A. glabratus*. Further strain studies have shown that *Biomphalaria boissyi* from Egypt is refractory to all strains of *S. mansoni* tested except the Egyptian strain, whereas *B. pfeifferi* from western Africa may serve not only as an intermediate host for the Egyptian strain, but equally as well for the parasitic strains from Puerto Rico, Venezuela, or Brazil.

Physiological experiments, particularly studies on the normal aerobic respiration and the inhibitory effect of various chemical compounds on the oxygen consumption of snails are being conducted in the Section of Physiology.

In the Section on Therapeutic and Preventive Measures snails are used in the screening tests of various chemical compounds in an effort to find a better molluscicide than the one now commonly used. In this study more than 500 chemical compounds have been tested against *Australorbis glabratus*, the principal intermediate host of *Schistosoma mansoni* in the West Indies and South America.

Lastly, malacological studies are being made on the known intermediate hosts of trematodes which are responsible for human diseases and also on the related species of snails which are native to the United States. A discussion of the close relationship between *Oncomelania hupensis* and *Pomatiopsis lapidaria* was made at the American Malacological Union meeting in 1947. Since that time it has been proved that *P. lapidaria* is capable of serving as an intermediate host of *Schistosoma japonicum*.

Recently a comparative study has been made on members of the Planorbidae which serve as intermediate hosts of *S. mansoni*. This study has shown that *Australorbis glabratus* from the West Indies and South America is closely related to members of the genus *Biomphalaria* from Africa. The close similarities found in the shells, the radulae, and the genital structures of the two genera are very striking and lead one to believe that the two have been derived from a common ancestor. This, incidentally, has led the author to consider the various principles of zoogeography.

It is difficult to explain why members of two closely related genera can be found in such widely separated continents. No living specimens have been collected in North America nor in Asia to indicate that the ancestral species once ranged over the Northern Hemisphere, nor have fossil specimens been found which would suggest such a wide distribution. It is inconceivable that accidental migration, either by migrating birds or by any other means, could account for the peculiar distribution of these two genera.

The unique relationship of certain plants and animals, including several genera of mollusks, common to South America and Africa has added to the support of the Displacement of Continents theory as proposed by Wegner in 1915 and more recently by Du Toit in 1937. This hypothesis proposes that the present land masses of South America, Africa, Arabia, India, Australia, and Antarctica were joined in one vast continent, Gondwana, during the Paleozoic era and gradually separated during Mesozoic times.

Du Toit's theory is not as enthusiastically supported by geologists and biologists of the United States as it is in other countries. His hypothesis, however, would explain the interesting relationship that is present between *Australorbis* and *Biomphalaria*.

In answer to the question by Mr. Jay Weber as to whether the parasites affect animals as well as man, Dr. Berry said that a tender host, as a young puppy, may become infected, but that a human host seems to be preferred. Dr. Aguayo remarked that Cuba is most grateful for the program of Schistosoma-control being carried on in the United States, since there is at present no such program in Cuba which perhaps needs it most. Mr. Gordon MacMillan asked where and when this plague started. "There are many kinds of Schistosomiasis," answered Dr. Berry. "Some of the parasites affect birds, some apes, and one type, common in this country, affects the human skin only. It is a very ancient disease and has even been detected in mummies." Miss Edna Haas asked, "Do we have potential hosts and carriers in this country?" "Yes indeed," was the answer, "all over the country, for the first part of the question. And as to the carrier-snails, *Pomatiopsis lapidaria* is our guilty party. *Tropicorbis lovanensis* of the vicinity of Baton Rouge is capable of carrying it also."

With this paper the academic portion of the convention was concluded. An invitation to partake of the well-known hospitality of Dr. Jeanne Schwengle at a cocktail party and buffet supper at 6:30 had been extended, to take place in the Pan American room of the Columbia Hotel in downtown Miami. The lecture program had lasted well into late afternoon, hence a mad scramble ensued to repair the ravages of a torrid day, air-conditioning notwithstanding, and the bus kindly furnished by the University to provide transportation downtown was greatly appreciated.

Dr. Schwengel's parties always high-light these meetings, and this one was no exception. A delicious repast followed the social hour, and it was still in a party-mood that the assemblage followed Mr. Ted Dranga, Pied Piper style, into the balmy night. Along beautiful Biscayne Boulevard, past luring rival shops he led, finally into his own place of business, stocked to the rafters with shells and shell products.

Handing out samples with great generosity, answering questions showered from all sides, genial Ted was in his glory, and the rain which began to pour down outside kept everyone until a late hour.

Saturday was devoted to field trips; the boat of the Biological Marine Laboratory transported thirteen would-be divers to a reef near Elliott Key, while a greater number who preferred to do their collecting closer to shore were taken to a shoal at the north end of Key Largo — more detailed description of these two expeditions appear elsewhere, but additional credit must here be given for the whole-hearted cooperation of Miami University which made these trips the unqualified success they were. Two buses, the boat with complete diving facilities, all collecting paraphernalia for the shore party — nothing was over-looked, and organizers of future A. M. U. field trips would do well to copy the technique of Miami University.

All good things must end, and so too must each A. M. U. Annual Meeting accompanied always by:

"A feeling of sadness and longing, that is not akin to pain,  
And resembles sorrow only as the mist resembles the rain."

But it was Saturday night, the Convention was finished, the field trips were happy memories, and "See you next year!" was the favored phrase as the general exodus took place. A few laggard souls met for breakfast on Sunday, but before the day passed they too were gone, and the 1949 A. M. U. Annual Meeting was history.

Respectfully submitted,

MARGARET C. TESKEY,  
Secretary pro tem.

## MARINE COLLECTING FROM THE "MEGAPOLE" GORDON K. MACMILLAN

Twelve members of the American Malacological Union signed up as "crew" on the 40-foot motor launch, the "Megalope," on Saturday morning, June 18, 1949, to participate in some shallow water diving in a coral reef for marine invertebrates. The trip was under the able guidance and direction of Dr. Charles E. Lane of the Marine Laboratory of the University of Miami. Dr. Lane acted as navigator at times, but it was Mr. C. E. Dawson who took charge of the wheel most of the time.

The "crew" of the "Megalope" consisted of Mrs. Lilius F. Cockerill, Miss Helen M. Brewster, Miss Edna Haas, Dr. H. B. Stenzel, Yetta and Sonya Stenzel, Miss Stella Cooper, Miss Esther S. Bates, Miss Judy Hudgings, Mr. Eugene H. Schmeck, Mr. Thomas Moore, and Mr. Gordon K. MacMillan.

Upon the arrival at the docks by the University of Miami Bus, the "crew" boarded the boat and signed the log. The anchor was weighed and the "Megalope" was on its way. The launch took a southeasterly course through the Miami Municipal Channel, entering the Atlantic Ocean through the Government Cut. On the port side was the MacArthur Causeway and the southern tip of Miami Beach. Upon entering the Atlantic Ocean the course was set south, travelling some 30 miles before dropping anchor, passing Soldiers and Elliott Keys to the starboard. Dr. Lane was the first to don the breastplate, diving helmet and to descend to the floor of the ocean fifteen feet below for exploration. He brought up a large piece of coral growth from which a number of multicolored crustacea were found in the cracks and crevices. Clinging to the outside of the coral growth were a few limpets. Embedded in the calcareous structure were some boring pelecypods which had to be removed by breaking the coral mass in small pieces. Mr. Schmeck, Miss Hudgings, Miss Brewster, Yetta Stenzel, and Mr. Moore also descended to the coral reef.

The ocean was somewhat choppy that day, causing the launch to roll from starboard to port and back again. Occasionally, when a wide trough was met, the boat dipped down at the bow. This continual rolling and dipping soon upset the equilibrium of some of the members of the "crew" who, as Mrs. Teare so aptly put it, "suffered from mal de mer and not all of these were of the weaker sex."

Besides those who suffered from sea sickness, the only other event of any significance during the trip was the loss of the bow anchor when the rope holding it became frayed and cut through by the motion of the boat. This might have had serious consequences in fouling the air line or in pulling the diving helmet from the wearer as the boat began to swing in an arc from the stern anchor. Upon the discovery of this loss, all diving operations were suspended.

Although collecting on the ocean bottom was not too profitable that day, the number of marine specimens gathered were sufficient to warrant calling the trip a success and was enjoyed by all, even by those who were "under the weather."

## THE KEY LARGO TRIP MARGARET M. TEARE

June 19, 1949, directly after breakfast at the Students' Club Cafeteria, fifteen members and two guests, all in a gay mood despite the fact that all were weary from walking miles around the campus the previous two days of the meeting, boarded a University of Miami bus and started a rather long but interesting trip to Key Largo.

Most of the members of the group were wisely clothed, but a few left wide open spaces, such as midriffs and so forth, which afforded the mosquitoes an

opportunity to attack en masse. All collectors were well stocked with lotions of various kinds but on the return trip it could be observed that the lotions were either ineffective or had been too sparingly used.

The driver parked the bus off the main highway near an inlet, the area around which provided both land and marine collecting. The most exciting specimens found were two quite large beautiful purplish sea anemones. The writer saw many small white anemones but they looked very ordinary after seeing the purplish ones.

After two or three hours the hungry collectors could be seen coming back from all directions. Upon comparing the loot one could hear many "Ahs" and "Ohs" and "I believe my specimen is larger than yours" or vice versa.

After resting and enjoying the basket lunch put up by the cafeteria we returned to the dormitories, only to be faced with the unpleasant task of cleaning some of our specimens. On the return trip a stop was made at Homestead for a treat as the guests of Capt. Arthur Haas of St. Petersburg, Fla.

Candid camera pictures were taken by one or two of the members and some of the pictures are not too complimentary but amusing; they might be titled "As others see us." It is however nice to have these snap shots and they greatly add to the enjoyment.

The following is a partial list of specimens collected: *Drymaeus multilobatus*, Say; *Cerion incanum*, Binney; *Microceramus pontificus*, Gould; *Ischnochiton floridanus*, Pilsbry; *Turbo castaneus*, Gmel; *Astrea longispina*, Lam; *Tectarius muricatus*, Linné; *Murex cellulosus*, Conrad; *Cerithium muscarum*, Say; *Melampus bidentatus*, Say; *Arca barbata*, Linné; *Vasum muricatum*, Born; *Fasciolaria tulipa*, Linné; *Nerita peloronta*, Linné; *N. tessellata*, Gmel; *N. versicolor*, Gmel.

## MEMBERS AND GUESTS REGISTERED

### CONNECTICUT

Dr. Jeanne S. Schwengel, Greenwich

### FLORIDA

Miss Esther S. Bates, Daytona Beach

Miss Helen M. Brewster, St. Petersburg

Leo A. Burry, Pompano Beach

Mrs. Lillias Cockerill, Sanibel Island

Miss Theresa Donnelly, St. Petersburg

Mr. and Mrs. James W. Donovan, West Palm Beach

Mr. and Mrs. Ted Dranga, Miami

Mr. and Mrs. Harley L. Freeman, Ormond Beach

William Grimm, Miami

Capt. Arthur Haas, St. Petersburg

Miss Edna Haas, St. Petersburg

Miss Judy Hudgings, Winter Park

Thomas Hughes, Fort Pierce

Paul L. McGinty, Boynton Beach

Paul P. McGinty, Boynton Beach

Thomas L. McGinty, Boynton Beach

Miss Helen Montgomery, Miami

Donald Moore, Hobe Sound

Miss Katherine Schiro, Tampa

Miss Mildred Smith, Miami

Mr. and Mrs. W. Donald Thomas, Miami

Mrs. Ernestine Taylor, Tampa

Gilbert Voss, Hypoluxo

Jay Weber, Miami

MASSACHUSETTS

William J. Clench, Cambridge

MICHIGAN

Dr. Henry van der Schalie, Ann Arbor

NEW YORK

Eugene H. Schmeck, Niagara Falls

Mrs. Margaret M. Teare, Buffalo

Mrs. Margaret Teskey, Buffalo

PENNSYLVANIA

Dr. and Mrs. Horace B. Baker, Philadelphia

Gordon K. MacMillan, Pittsburgh

Dr. Henry A. Pilsbry, Philadelphia

TEXAS

Dr. and Mrs. H. B. Stenzel, Austin

Miss Sonya Stenzel, Austin

Miss Yetta Stenzel, Austin

DISTRICT OF COLUMBIA

Dr. Paul Bartsch, Washington

MARYLAND

Dr. and Mrs. Elmer G. Berry, Bethesda

CUBA

Dr. Isabel Perez Farfante, Havana

Dr. Carlos G. Aguayo, Havana

## MINUTES OF THE AMERICAN MALACOLOGICAL UNION PACIFIC DIVISION

On Friday afternoon, June 10, 1949, about fifty conchologists assembled at the Municipal Auditorium, Long Beach, California. Registration was held at 1:30 P. M. Sixty-seven persons attended the three day meeting.

The meeting was called to order at 2:30 P. M. by acting chairman John Q Burch who gave a speech of welcome to the group. A telegram was received from Miss Ruth E. Coats, chairman, who could not attend the meeting because of illness. A telegram also was received and read from Mr. and Mrs. Harold Robertson, treasurer and secretary respectively of the parent organization of the American Malacological Union. Mr. H. Arden Edwards, chairman of the Long Beach Shell Club, then gave an address of welcome to the assembled group and followed his address with an interesting discussion of the early founders of that club.

Next followed a reading of the minutes. The secretary-treasurer pointed out that certain questions had arisen regarding which there were no formal rules of procedure. A motion was made by Mrs. J. Q. Burch that all doubtful points of procedure should be decided by the council. The motion was seconded and approved. Mr. Burch stated that the council would meet and follow the general practice of the parent organization.

Mrs. Ralph O. Bormann suggested that a letter be sent Mr. Lee of the Long Beach Convention Bureau, officially thanking him for the courtesies and conveniences furnished the meeting by his organization. This was approved by the members. It also was moved, seconded and carried that a telegram be sent Miss Ruth E. Coats and that a letter, signed by those present, be sent Miss Julia Ellen Rogers. Miss Rogers, one of the founders of the Long Beach Shell Club, was

not able to attend the meeting due to the state of her health. She had intended to present a paper entitled "Short Historical Review — Conchology in Southern California." Mrs. Burch then announced that fifty-seven reservations for dinner on Saturday had been received. Attention was called to the exhibition of shells by the Agassiz Nature Club of Long Beach on the mezzanine floor of the auditorium.

Mr. Harry R. Turver called attention to the fact that several collectors had experienced confiscation of uncleared shells by United States officials at the Mexican boundary, as a result of a ruling to that effect by the U. S. Surgeon General. Mr. Turver asked whether it would be in order for the present organization to write a letter to the Surgeon General explaining that no danger of infection bearing organisms was present in uncleared marine shells. After a discussion by Mr. J. Q. Burch and others Mr. Turver made a motion that a letter such as already mentioned be written the Surgeon General. The motion was seconded and carried. Mr. Burch then appointed a committee composed of Mr. H. R. Turver, Mr. A. Sorensen and the secretary, to prepare and send the letter.

Mrs. E. P. Chace mentioned that a card should be sent to Mrs. Case of San Diego, California, who was ill and unable to attend the meeting. Mrs. A. T. Whelchel was appointed to secure a card and signatures of those present and send to Mrs. Case.

The meeting then was turned over to Mr. Harry R. Turver, chairman of the program committee. Mr. Turver introduced the members of his committee all of whom aided in the details of the arrangements. This committee, in addition to Mr. Turver, was composed of the following: Mr. H. Arden Edwards, President, Long Beach Shell Club; Mr. Edward Baker, Program; Mrs. Mary Bormann, Program and Entertainment; Mrs. Mary Turver, Program and Entertainment; Mrs. Jean Wilkins, dinner arrangements; Mrs. John Q. Burch, reservations for Annual Dinner. Mr. Turver then introduced the speakers on the program.

The first paper was by Mr. A. Sorensen on "Some Observations on Haliotidae and their World Distribution." Discussion followed by Mr. E. P. Chace, J. Q. Burch and H. R. Turver.

## SOME OBSERVATIONS ON HALIOTIDAE AND THEIR WORLD DISTRIBUTION ANDREW SORENSEN (Abstract)

The Haliotidae (abalones) represent a primitive family of Gastropoda known to range from Cretaceous to Recent. A few species occur today in the Atlantic and Indian Oceans but the great majority occur in the temperate waters of the North Pacific from Cape San Lucas, Lower California, to Japan, and south to Australia and New Zealand. Over a dozen species and varieties occur in the region between Cape San Lucas and Alaska. Most of these occur in the littoral zone and in waters to a depth of approximately 120 feet or so. The larvae, at least in some species, are free swimming for a very short time. These animals are much in demand for food, and rigid enforcement of conservation measures is needed to save these interesting snails.

Dr. S. S. Berry then spoke on "A new spectacular find — a new Cephalopod found in California."

The meeting then adjourned.

The evening meeting was called to order at 8 P. M. and Mr. Turver then introduced Mr. J. G. Carlisle, Jr., who spoke on "The Problem of the Abalone." Drawings were exhibited. Discussion followed by A. Sorensen, S. S. Berry, W. M. Ingram, H. R. Turver, Miss A. G. Shumaté and Mrs. E. P. Chace.

THE PROBLEM OF THE ABALONE  
ARTIFICIAL SPAWNING AND FERTILIZATION OF *Haliotis rufescens*  
JOHN G. CARLISLE, JR.

It has proven possible to induce artificial spawning and fertilization in the red abalone, *Haliotis rufescens* Swainson, by a period of desiccation of about one hour and fifteen minutes. Spawning occurs some six to eight hours later. Fertilization results in typical mollusk cleavage stages. Then, as might be expected from this dioecious gastropod's phylogenetic relationship, it develops into an active free swimming trochophore, followed by the veliger stage. The embryonic shell forms during the second day, and after seven days is very similar to that of small metamorphosed specimens collected in the field.

Dr. A. Myra Keen then presented a paper entitled 'Phylogeny of *Nemocardium*.' Drawings were exhibited. Discussion followed by J. Q. Burch.

The meeting was adjourned.

PHYLOGENY OF THE GENUS *Nemocardium*

A. MYRA KEEN

(Abstract)

The genus *Nemocardium* has the longest time range of any game in the family Cardiidae, and few other modern genera range farther back in time. It began in the early Cretaceous, flourished widely during the Eocene (33 species), then gradually disappeared, so that, in the strict sense, *Nemocardium* is represented today by only a single species, *N. bechei*, in the China Sea area. Other Recent species must be assigned to subgenera of *Nemocardium*, such as *Pratulum*, which has three. The West American species *N. centifolium* Carpenter seems to be a member of an as-yet-unnamed subgenus, together with *N. samarangae* of Japan and an unnamed Pliocene fossil species from Washington.

The meeting reconvened Saturday morning, June 11, at 10 A. M. Greetings on behalf of the City of Long Beach were extended to the group by Mayor Burton W. Chace who presented the chairman with a key to the city.

A letter received from Miss Julia Ellen Rogers was read by the secretary. This was followed by a paper presented by Mr. E. P. Chace, "Notes on the Genus *Monadenia* of the Coastal Sections." Discussion by S. S. Berry followed.

NOTES ON THE GENUS MONADENIA OF THE COASTAL SECTIONS

E. P. CHACE

(Abstract)

A colony by colony discussion of the Monadenias of the coastal regions of California, Oregon and Washington, showing the smooth transition from typical *infumata* Gld. of the San Francisco Bay area to the form called *subcarinata* by Hemphill. It is suggested that perhaps *subcarinata* Hemphill should be called a variety of *infumata* Gld. rather than of *fidelis* Gray. The change from *subcarinata*, to true *fidelis* (in the region around Eureka) on the other hand is an explosion of characters. Certain colonies contain some specimens definitely *fidelis* in appearance, others just as definitely *subcarinata*, the rest with a confusing mixture of characters. My conclusion is that here we deal with hybrids. North of Orick, California, in the true *fidelis* territory, some colonies appear to be made up of representatives of 2 or even 3 named subspecies which were described from fairly homogeneous colonies some distance away. This variability, within a colony, lessens along the coast north of the Umpqua River in Oregon, and almost disappears east of the Coast Range.

Next followed "Pearl Culture, a Film of Japan's Important Industry." Narration by Dr. A. M. Keen.

THE JAPANESE PEARL CULTURE INDUSTRY  
A. MYRA KEEN  
(Abstract)

This film is shown by courtesy of Lt. Col. Hubert G. Schenck, now Chief of the Natural Resources Section under General MacArthur in Tokyo. It shows the complex process of pearl production as perfected by Mr. K. Mikimoto.

The first step is the collection of pearl oysters (*Pinctada martensii* Dunker), which may be obtained directly by diving for adult shells or by the collection of spat in special cages. The latter method, now usually used by Mikimoto, requires culturing of the young shells for three years, with frequent inspections and cleaning of debris. Healthy oysters at the end of three years are ready for the grafting operation which is performed by skilled technicians who implant one or more pearl nuclei in the tissues of the animal. After three more years of care the oysters are harvested and the pearls recovered. These pearls are indistinguishable, except by the most elaborate electromagnetic and other tests, from true or natural pearls. They are then washed, sorted, counted, drilled, and assembled into matched strands for necklaces.

One cannot realize without seeing a film of this sort the amount of skilled work expended in the Japanese culture pearl industry, and after seeing the film one understands better why the price of pearls remains high.

Dr. L. G. Hertlein then presented a paper on "Some early Records of West American Marine Mollusks."

The meeting then adjourned following the announcement that a picture of the group would be taken on the terrace at 1:45 P. M.

SOME EARLY RECORDS OF WEST AMERICAN MARINE MOLLUSKS  
LEO GEORGE HERTLEIN

Spanish exploration of the western Americas began over 400 years ago. Apparently slight attention was given to the marine shells by these explorers except in the case of mollusks with definite commercial value such as the pearl oysters. News of pearl oysters in the Gulf of California is said to have been carried to Mexico City in 1534-1535 by members of the crew of Grijalva's ship which was taken to the peninsula of Lower California by Ordoño Jiminez.

An illustration believed to represent a west American shell is shown in Lister's *Historiae Conchyliorum*, 1685. Dillwyn's index to Huddesford's edition of Lister, 1770, stated (p. 34) regarding plate 724, figure 11, "*Voluta incrassata*; but not a good figure." If Dillwyn's conclusion as to this identification be accepted, it is one of the earliest representations of a west coast shell, *Voluta* (*Oliva*) *incrassata* Solander, 1786. The species was later described by Lamarck as *Oliva angulata*. The figure of *Cylinder prophryeticus* illustrated by Rumphius in his *D'Amboinische Rariteitkamer*, 1741, plate 39, figure 1, has been generally accepted as representing the west American species *Voluta* (*Oliva*) *porphyria* Linnaeus. A few other west American species, perhaps obtained through the pearl oyster trade, were described by Linnaeus in 1758.

The meeting reconvened at 2 P. M.

The first paper was by Dr. S. S. Berry, "New Light on Taxonomy of West American Species of *Crepidula*." Drawings were available for examination and specimens were exhibited.

NEW LIGHT ON THE TAXONOMY OF WEST AMERICAN SPECIES OF CREPIDULA  
S. STILLMAN BERRY  
(Abstract)

The history of the genus has been briefly sketched, with a somewhat more intensive outline of the work upon west American forms.

Characters found of practical value in taxonomy include the size, color, and form of the adult; the autochthonous sculpture; the character of the periostracum; the character of the septum and its margin; and the habit and shell characters of the larva. As first indicated but not closely followed through by Carpenter (1857), the larval characters appear especially important and dependable. Their study in the very difficult subgenus *Ianacus* show that, in spite of the confusing similarities and intergradations shown by many adults, this is far from being the monotypic group that many may have supposed, and that a high degree of speciation exists. The various Californian forms hitherto referred to the Panamic *nivea* are shown to be clearly distinct, and the existence of at least six distinguishable species of this subgenus in west American waters is demonstrated, all of them sharply different from one another in the larval and early post-larval stages. Some are shown to possess pelagic larvae, whilst the young of others are non-pelagic, a difference in fundamental ecology which is reflected in the formation of the shell. Larval peculiarities likewise suggest the distinctness of the Californian representative of the *aculeata*-group.

The numerous relevant names in the literature are discussed, and an attempt made to reach a satisfactory disposition of as many of them as possible.

It is suggested that further inquiry should be particularly directed toward establishing growth-series of some of the more poorly known forms such as *dorsata*, *marginalis*, *grandis*, the *excavata*-group, *glottidiarum*, and the other allies of "*perforans*," and that continued acutely critical work be carried through, further to test the taxonomic dependability of the remarkable larval characters described.

A photograph of the group, taken earlier in the afternoon, was then exhibited for the convenience of those wishing a copy. It was agreed that one be sent to Miss Coats and one be placed with the records of this organization.

Next on the program was a paper entitled "Bilateral Asymmetry" by Dr. J. L. Baily. Dr. Baily being absent the paper was read by Mr. Edward (Ned) Baker.

THE REVERSAL OF BILATERAL ASYMMETRY IN GASTROPODA

JOSHUA L. BAILY, JR.

(Abstract)

1. Relationship of environment to form of symmetry.
2. Discussion of visceral torsion.
3. Discussion of pallial torsion.
4. Discussion of chiastoneury.
5. Discussion of the three different types of asymmetry.
6. Discussion of hyperstrophe.
7. Discussion of heterostrophy.
8. Discussion of embryonic cleavage.
9. Discussion of matroclinal inheritance.
10. Discussion of the effect of ovoviviparity.
11. Discussion of the selectivity of death in intrauterine populations.
12. Possible explanations of such selectivity.
13. Hermaphroditism in heterogeneous populations.
14. Effect of reversal of asymmetry on evolution.

A paper by G. D. Hanna and A. G. Smith, "Shell collecting on the South Farallon Island" was read by Mr. Ralph O. Fox. Discussion followed by Mr. Sorensen and J. Strohbeen.

Next followed "Notes on West American Vermetidae" by Dr. A. M. Keen. Discussion followed by S. S. Berry.

The meeting adjourned.

## NOTES ON WEST AMERICAN SPECIES OF "VERMETIDAE"

A. MYRA KEEN

(Abstract)

Study of several species of the gastropods customarily classified as Vermetidae shows that the opercula and nuclear whorls are good guides for classification of the group. Nuclear whorls of all genera studied except *Vermicularia* show a 90-degree change in axis of coiling when the larval shell attaches itself to a substrate. *Vermicularia*, with an operculum and simple spiral nucleus like *Turritella* should be transferred to the family Turritellidae, as Merriam has suggested. A new family name must be proposed, as *Vermetus* is nomenclaturally a synonym of *Vermicularia*.

Opercula of the "Vermetidae" may be absent, as in *Aletes*, or may consist of transparent chitinous laminae wound spirally, as in *Dofania* and *Petaloconchus*, or may be concave to convex with an internal central knob as in *Spiroglyphus*. Nuclear whorls are ovate-conic, 3-whorled, white in *Aletes*; 2-whorled, brown in *Spiroglyphus* and *Dofania*; and cylindrical, 3-whorled, brown in *Petaloconchus*. Some variation among species within a genus has been noted, and much more study is needed.

The species listed as *Vermiculum anellum* (Mörch) by Dall, 1921, has been assigned to the genus *Segmentella* by Thiele, 1925, but it is probably a serpulid worm rather than a gastropod.

At 6:30 P. M. the group assembled at Moose Hall for the Annual dinner which was attended by 63 members and guests. Beautiful place cards bore an illustration of *Mitra episcopalis* hand painted by Mr. H. A. Edwards. After dinner entertainment followed by Mrs. B. E. Burchfield, accompanied by Mrs. Horace Knowles. Then followed entertainment by Mr. E. W. Ulrich, magician. Announcement was made that all were invited to tea following the close of the meeting on Sunday afternoon, at the home of Mrs. Ann Barnett, 63-64 Place, Long Beach.

The meeting then adjourned.

The meeting was called to order on Sunday morning June 12, at 10 A. M.

A very interesting paper was presented by Mr. H. Arden Edwards of the Southwest Museum, entitled "Ethnoconchology in the Southwest." This paper was illustrated by shell artifacts which Mr. Edwards had assembled.

Dr. A. M. Keen, chairman of the committee for election of officers for next year, announced the candidates as follows: John Q. Burch, chairman; Leo G. Hertlein, vice-chairman; Harry R. Turver, secretary-treasurer. Mr. Turver stated that for various reasons he felt obliged to decline the nomination. Mr. Sorensen then nominated Dr. Wendell O. Gregg for secretary-treasurer. Mr. Sorensen then moved that the slate of new officers be unanimously approved. The motion was seconded and carried.

Mr. A. M. Strong then spoke briefly about an oyster, apparently a variant of the *Ostrea lurida* group, which was collected at Newport Bay. The specimen was passed around for examination. Discussion followed by Mr. Sorensen, S. S. Berry and J. Q. Burch.

Mr. H. R. Turver then gave a report on the state of the treasury and reported a cash balance at that time of \$28.15. Mr. Burch again extended thanks of the group to Mr. Turver, Mrs. Bormann, Mrs. Burch and Mrs. Turver, whose

efforts so greatly contributed to the success of the meetings. The meeting adjourned.

At 1:30 P. M. the meeting was called to order in the reading room on the lower floor of the Public Library. Mr. Burch then turned the meeting over to Mr. Turver.

The first paper was by Mr. A. M. Strong entitled "Marine Gastropod Fauna of Guadalupe Island, Mexico." Discussion followed by L. G. Hertlein, S. S. Berry, Mr. and Mrs. E. P. Chace, W. O. Gregg, H. A. Edwards.

Next followed a paper by Dr. W. O. Gregg on "Terrestrial Gastropod Fauna of Los Angeles County (exclusive of the Channel Isles)." Specimens were exhibited for examination. Discussion followed by Mrs. E. P. Chace.

## THE TERRESTRIAL GASTROPOD FAUNA OF LOS ANGELES COUNTY, CALIFORNIA (EXCLUSIVE OF SANTA CATALINA AND SAN CLEMENTE ISLANDS)

WENDELL O. GREGG

Abstract)

Although Los Angeles and vicinity has long been the home of many conchologists, interest has generally been in marine mollusca rather than in the nonmarine groups. The aquatic species are unattractive and many of the land forms are small and inconspicuous. Most of our land snails are hard to find. During the time generally required to collect a few land snails of a single species, one can readily go to the sea-shore and collect a score or more of species of marine mollusks, some in vast numbers, and many of them of the larger conspicuous forms. Notwithstanding, considerable work has been done on our local land snail fauna.

From the area under consideration has come type material for the following eight species and subspecies: *Helminthoglypta traski* (Newcomb), 1861; *Punctum conspectum pasadenae* Pilsbry, 1896; *Helminthoglypta petricola sangabrielis* (Berry), 1920; *Helminthoglypta fontiphila* Gregg, 1931; *Helminthoglypta traski pacoimensis* Gregg, 1931; *Helminthoglypta tudiculata imperforata* Pilsbry, 1939; *Glyptostoma gabrieliense* Pilsbry, 1939; and *Sonorelix (Herpeteros) angelus* Gregg, 1949.

From the mainland portion of Los Angeles County 44 species and subspecies of land gastropods are known. Of these 33 are endemic and 11 are introduced. We have 35 species and subspecies of land snails, 29 endemic and 6 introduced. There are 9 species of slugs, 4 endemic and 5 introduced. Of the endemic forms, 9 families and 20 genera are represented.

In Dr. Pilsbry's monograph, Land Mollusca of North America, Los Angeles County records are listed for 27 species and subspecies. In addition, the following 17 forms have been found: *Sonorelix angelus* Gregg, *Euconulus fulvus alaskensis* (Pilsbry), *Oxychilus cellarius* (Müller), *Oxychilus draparnaldi* (Beck), *Oxychilus alliarius* (Miller), *Pristiloma chersinella* (Dall), *Hawaiia minuscula neomexicana* (Ckll. & Pls.), *Deroceras laeve* (Müller), *Discus cronkhitei* (Newcomb), *Oxyloma sillimani* (Bland), *Succinea avara* Say, *Quickella rebderi* Pilsbry, *Vertigo ovata* Say, *Vertigo californica* (Rowell), *Vertigo californica trinotata* (Sterki), *Vertigo rowelli* (Newcomb), and *Sterkia hemphilli* (Sterki).

Mr. Turver then announced that this completed the program. Mr. Burch, in his closing remarks, requested that all speakers submit abstracts of their papers. He expressed thanks to all, especially the program committee, for arranging such a fine program. Attention was called to the exhibit of shells on the second floor of the library, sponsored by the Long Beach Shell Club.

The meeting adjourned at 3 P. M.

LEO G. HERTLEIN,  
Secretary-Treasurer.

# **THE AMERICAN MALACOLOGICAL UNION**

## **THE SIXTEENTH ANNUAL MEETING**

**June 14 to 16, 1950**

The American Malacological Union will hold its 16th Annual Meeting in Chicago, Ill., June 14, 15, 16, 1950.

The meetings will be held in the Chicago Natural History Museum where Dr. Fritz Haas, President of the Union, is in charge of the conchological collection.

Announcement of hotel accommodations and other details will be made later.

### **THE THIRD ANNUAL MEETING OF THE PACIFIC DIVISION AMERICAN MALACOLOGICAL UNION**

Mr. John Q. Burch reports: "We have finally agreed and made all arrangements for the 1950 meeting of the Pacific Division. We are to meet April 7, 8, and 9, at the Barbara Hotel, Santa Barbara, California. There are many advantages to this because we will have an amply large meeting room on the main floor of the hotel, and also in the same hotel there is a very good dining room, also a coffee shop. So we will meet, sleep, eat, and have our annual banquet all under the same roof."

Any of our eastern members will be cordially welcomed at this meeting.

### **OUR MEMBER CLUBS**

CLENCH CONCHOLOGICAL CLUB, Worcester, Mass., Carl W. Erickson, Secretary: The Clench Conchological Club of The Worcester Museum of Natural History, an outgrowth of the course in shell study conducted by the Museum, is now five years old. The past year has been one of varied activities, an outstanding event being a talk by Dr. A. B. Leonard, Professor of Biology at the University of Kansas, on "The Ozark Mountains," where he had spent several months in field work on mollusks. Another highlight was a laboratory session with William J. Clench, Director of the Department of Mollusks at the Museum of Comparative Zoology in Cambridge, and in whose honor the club is named. This study concerned the radula. A third visiting speaker was James Kemp, a biology student at Clark University, who spent an evening with us in dissections of mollusks.

We have had three profitable field trips, one to the home of Mrs. William Amory at Wareham, where her collection of over 12,000 specimens was on display; one with the Forbush Bird Club to Scituate, and the third in the woods of the Johnson Farm in Leicester.

Meetings are held at the Museum of Natural History and in homes of members, the annual Christmas party being at the home of Miss Rena Small, when a shell auction for the benefit of the club's treasury was held, followed by a showing of kodachrome slides of the field trips.

The club has decided to have but one formal meeting a month instead of two, beginning in September. A program for these meetings is to be prepared in advance, and we hope to have among the speakers the world's foremost authority on shells in medicine.

**CONCHOLOGICAL SECTION**, Buffalo Society of Natural Sciences, Buffalo, N. Y., Mrs. Margaret C. Teskey, Secretary: An interesting program was carried out the past season. Because of the illness of Harold R. Robertson who is confined to the house, though actively interested in shells, the meetings were held at the Robertson home, Mrs. Robertson being president of the club.

Meetings are held at 8 o'clock on the first Saturday evening of the month from September to June. The June meeting commences in the afternoon with a picnic supper on the lawn preceding the evening session.

At the September, 1948 meeting, reports of the Pittsburgh meeting of the American Malacological Union were given by members of the club who attended, Mrs. Margaret M. Teare, Mrs. Margaret C. Teskey, Miss Gertrude M. Weber, and Mr. Eugene H. Schmeck. Other meetings have featured discussions of local shells by Mrs. Teskey and Mrs. Robertson, "The Spiritual Value of the Study of Shells," by Mr. Robertson, kodachrome slides of nature subjects by Miss Louise Becker and another showing by Clifford Awald, a paper on "The Microscopic Food of Mollusks," by Miss Jean Russell, and a radio skit written by Miss Weber, entitled "A Day in the Life of the Shelling Twins," with Mrs. Norma Ashbery as an interested shell expert observing the enthusiasm of Miss Becker and Miss Weber impersonating the twins. It was based on actual collecting experiences in the Grand River, Ontario. An exhibition meeting featured displays of shells which members had studied or acquired during the past year.

The club was fortunate in having had three visits during the season, from Rev. Paul D. Ford, well known as a collector of Bahamas shells. On each occasion he brought many of his unusually beautifully prepared and arranged specimens for display and discussion. One of his talks on "How to Study Your Shells," gave us an incentive to go over our collections carefully with a view to discovering hitherto unrecognized varieties among some of the species.

**LONG BEACH SHELL CLUB**, Long Beach, Cal., Ralph Bormann, Secretary-Treasurer: This active organization was founded in 1938, and has been doing magnificent work in the years since. Meetings are held in the Children's Room of the Long Beach Library at 2:30 P. M. the second Sunday of the month. Field trips and lectures with an annual Water-melon party in July and a Christmas party and Shell exchange in December, highlight the year.

Subjects on the program for 1949 are: "Starfish of Pacific Coastal Waters and Their Relation to Mollusks," by Harry Turver; "Cephalopods," by Dr. Howard R. Hill; "Methods and Means of Preserving and Mounting Shells and Marine Creatures," by H. Arden Edwards.

The club was host to the Pacific Division of The American Malacological Union's second annual meeting, June 10, 11, and 12.

**NEW YORK SHELL CLUB**, Dr. Walter Jacobs, Secretary: This club is barely a year old, but it has an ambitious program of lectures and exhibitions. Meetings are held on the last Sunday afternoon of the month at three o'clock in Room 129, American Museum of Natural History.

At an early meeting Mr. Fred Tobleman of Newark, N. J., discussed radulae and how to mount them, illustrating his talk with some of his own microscopical slides. Anthony D'Attilio of Yonkers, N. Y., displayed some of his shell rarities at another meeting, and at still another, Mrs. H. F. Entwistle of Nutley, N. J., exhibited mounted specimens of fossil shells dredged from Lake Okeechobee, Fla.

Any one interested in shells, living in or near New York City, should get in touch with this lively group.

## ACTIVE MEMBERS

- Abbott, R. Tucker, U. S. National Museum, Washington 25, D. C.  
Abdel-Malek, Emile T., Museum of Zoology, Ann Arbor, Mich. Anat. of f. w. snails.  
Aldrich Museum, 12 Bay Island, Balboa, Cal. Conch., and mineralogy exch.  
Aguayo, Dr. Carlos Guillermo, 4 No. 554 Vedado, Habana, Cuba.  
Alexander, Robert C., 423 Warwick Rd., Wynnewood, Pa.  
Allen, Charles A., 1094 S. King St., Honolulu 53, T. H.  
Ancona, Prof. Ignacio, Instituto de Biologica Casa del Lago de Chapultepec, Mexico D. F.  
Anderson, Lt. Col. A. S., 700 S. Sycamore St., Petersburg, Va.  
Anderson, Miss Eva M., 7220 Lincoln Dr., Philadelphia 19, Pa.  
Andrews, Elizabeth, 605 Pershing Dr., Silver Spring, Md. Col. on outer banks, N. C. coast.  
Andrews, Mrs. James N., Somerset, Va.  
Archer, Harry B., 7239 Third Ave., N., St. Petersburg 6, Fla.  
Ashbery, Mrs. Wallace H., 12 E. Depew Ave., Buffalo 14, N. Y.  
Atwater, Rev. David T., 50 Grace Court, Brooklyn, New York 2, N. Y.  
Awald, Clifford J., 162 Southwood Dr., Kenmore, N. Y.  
Bailey, Prof. John Wendell, 27 Willway Rd., Richmond 21, Va.  
Baily, Dr. and Mrs. Joshua L., Jr., 4435 Ampudia St., San Diego 3, Cal.  
Baker, Edward Perin, 11619 Downey Ave., Downey, Cal. Pacific coast marine life  
Baker, Dr. and Mrs. Horace B., Zoological Lab., Univ. of Penn., 38th St. and Woodland Ave., Philadelphia, Pa. Res. 11 Chelten Rd., Havertown, Pa.  
Balch, Prof. Francis N., 130 Prince St., Jamaica Plain, Mass.  
Bales, Mrs. Blenn R., 149 West Main St., Circleville, O.  
Barnett, Mrs. Mary Ann, 63, 64 Place, Long Beach 3, Cal.  
Bartlett, Mrs. R. D., 200 Cedar Croft Rd., Baltimore 12, Md. E. coast shells Md. to Fla.  
Bartsch, Dr. Paul, Smithsonian Institution, U. S. National Museum, Washington 25, D. C.  
Bates, Miss Esther S., "the book nook," 7 South Ocean Ave., Daytona Beach, Fla. Exch.  
Bayer, Frederick M., Div. of Marine Invert., U. S. Nat'l Museum, Washington 25, D. C.  
Beatty, Mrs. Harold C., 220 Durston Ave., Syracuse, N. Y.  
Beatty, Mrs. Harold C., Mingo Lodge, Skaneateles, N. Y.  
Becker, Miss Louise W., 260 Richmond Ave., Buffalo 13, N. Y.  
Belanger, Alice Lois, Indian Springs Farms, Riverdale Ave., R.F.D. 1, Eatontown, N. J.  
Bennett, Miss Susan A., 37 Legare St., Charleston 2, S. C.  
Bequaert, Dr. Joseph C., Museum of Comparative Zoology, Cambridge 38, Mass.  
Berger, Mr. and Mrs. John N., "Tanglewood," Lake Jimerson, Angola, Ind.  
Berry, Dr. and Mrs. Elmer G., National Institutes of Health, Bethesda 14, Md.  
Berry, Dr. S. Stillman, 1145 W. Highland Ave., Redlands, Cal.  
Bippus, Alvin C., Jr., 1918 Bayard Pl., Toledo 6, O. Col. Marine univalves.  
Bloom, Robert J., 104 Eloise Terrace, Syracuse 7, N. Y.  
Boeheim, Mrs. C. H., 305 West Main St., Palmyra, N. Y.  
Bollinger, Mrs. C. C., Lakeview, Mich.  
Bormann, Mrs. Mary, 4331 Vermont St., Long Beach 14, Cal.  
Bourgeois, Miss Marie E., 3a Tiziano 35, Mixcoac D. F., Mex.  
Brand, Dr. Donald D., Dept. of Geog., Univ. of Mich., Ann Arbor, Mich. Latin Am. land shells.  
Branham, Capt. and Mrs. Hugh G., "Spindrift," Fort Myers Beach, Fla.  
Brewster, Miss Helen M., 305 5th St. S., St. Petersburg 5, Fla., and East Troy, Wis.  
Brill, J. A., 1150 Willmette Ave., Willmette, Ill.

- Bristol, Miss Viola S., 1253 12th Ave., San Diego 2, Cal.
- Bronson, Albert B., Sta. 11, Box 4M, Guam.
- Brown, J. J., Rehabilitation Director, State Board of Vocational Education, P. O. Drawer BB, Capitol Sta., Austin 11, Tex.
- Bruce, Karl L., 12 Florence St., Roslindale, Mass.
- Brunson, Royal Bruce, Montana State Univ., Missoula, Mont.
- Burch, Mr. and Mrs. John Q., 4206 Halldale Ave., Los Angeles 37, Cal.
- Burch, Dr. Paul R., 614 W. Fourth St., Radford, Va.
- Burch, Thomas, M. D., PHS, APO 839, c/o P. M., New Orleans, La
- Burkhardt, Lorilee, 62 Lexington Ave., Holyoke, Mass.
- Burrow, Mrs. F. H., 1401 Plass Ave., Topeka, Kan.
- Burry, Leo A., Burry's Marine Museum, Box 52, R-1, Pompano, Fla.
- Chace, Mr. and Mrs. E. P., 24205 Eshelman Ave., Lomita, Cal.
- Champion, Dr. Merrill E., 42 Anderson St., Boston 14, Mass.
- Cheever, Dr. Austin W., 464 Beacon St., Boston 15, Mass.
- Chen, Suifong, U. S. National Museum, Washington 25, D. C.
- Chenoweth, Paul, 2090 Beach St., San Francisco 23, Cal. Marine invert. natural habitat.
- Church, Austin, 165 George St., Trenton, Mich. P. O. Drawer C.
- Ciarla, Otello, Rua Augusta 91, Rio de Janeiro, Brazil. Local and foreign shells; books.
- Claar, Elmer A., 1400 Lake Shore Dr., Chicago, Ill. Coll. *Cypraea*.
- Clark, Mrs. Effie M., P. O. Box 511, Yuba City, Cal.
- Clench Conchological Club, 12 State St., Worcester 8, Mass. Shells and their collection.
- Clench, William J., Curator of Mollusks, Mus. of Comp. Zool., Cambridge, Mass. Coll., exch., buy.
- Coats, Mrs. Emma W., 702 E. First St., Tillamook, Ore.
- Coats, Ruth E., 702 E. First St., Tillamook, Ore. Exch. f.w. and Puget Sd. marines.
- Cockerill, Mrs. Lilius F., Sanibel, Fla.
- Coles, Mrs. Mary J., 320 Montero St., Balboa, Cal.
- Colitz, Mrs. Samuel, 15 Capwell Ave., Pawtucket, R. I. Oct. to June, Box 1084, Hollywood, Fla.
- Conchological Section, Buffalo Society of Natural Sciences, c/o Mrs. Percy Teskey, 144 Harlem Ave., Buffalo 10, N. Y.
- Conkling, Joseph E., Box 264, Edgartown, Mass.
- Corbett, William Phelps, 185 Grove St., Plainfield, N. J. Exch. rare *Cypraea*, *Murex* and *Oliva*.
- Craig, Miss Mary Eleanor, 1936 Harding Ave., Miami Beach, Fla.
- Cram, Dr. Eloise B., Federal Security Agency, U. S. Public Health Service, National Inst. of Health, Bethesda, Md.
- Damron, Mr. and Mrs. Michael C. E., 625 Almeria, Coral Gables, Fla.
- D'Attilio, Anthony, 102 Hilltop Acres, Yonkers 4, N. Y.
- Dawley, Miss Charlotte, The Woman's College, Univ. of N. C., Greensboro, N. C.
- Demond, Miss Joan, Box 425 Mills College, Oakland, Cal.
- Desmond, Hon. Thomas C., P. O. 670, Newburgh, N. Y.
- DeWitt, Robert N., Zoology Dept., University of Michigan, Ann Arbor, Mich. *Physidae*.
- Dexter, Dr. Ralph W., Dept. of Biology, Kent State Univ., P. O. Box 507, Kent, Ohio.
- Diaz, Dra. Amy E. Aguilar, San Benigno, No. 504 Altos, Santos Suarez, Habana, Cuba.
- Dodge, Henry, 6 Rochambeau Rd., Scarsdale, N. Y.
- Dollison, Robert Jr., 1621 Hillcrest Ave., Winter Park, Fla.
- Donovan, Mr. and Mrs. James W., 3718 Calvin Ave., West Palm Beach, Fla.
- Dominguez, Dr. Nicolas, 5 a y 13, Amplicion de Almendares, Marianao, Habana, Cuba.
- Donnelly, Miss Theresa J., 428 3rd Ave. S., St. Petersburg, Fla.
- Dorasavage, W. C., M.D., 700 Mahantonga St., Pottsville, Pa.

- Doremus, E. C., 227 Holmes Ave., Boonton, N. J.  
Drake, Robert J., 115 N. University Ave., Albuquerque, N. Mex  
Dranga, Ted., 3462 Main Highway, Miami 33, Fla.
- Eaton, Miss Ruth E., 3333 Orange St., Riverside, Cal.  
Edwards, H. Arden, Southwest Museum, Los Angeles 41, Cal.  
Eggleson, Dr. Harla Ray, Chairman, Dept. of Biol., Marietta College, Marietta, Ohio.  
Emerson, William K., Allan Hancock Foundation, Los Angeles, Cal.  
Emery, Dan L., 121 20th Ave. S., St. Petersburg 5, Fla.  
Entwistle, Mrs. H. F., 49 Beech St., Nutley, N. J.  
Erickson, Carl W., 4 Windsor Ave., Auburn Mass.  
Erskine, Mrs. A. de W., 1338 N. Dearborn St., Chicago, Ill.  
Etter, Mrs. Georgia M., R. F. D. 1, Box 29a, Finney's Wharf Rd., Onancock, Va.  
Eyerdam, Walter J., 7531 19th Ave. N.E., Seattle 5, Wash.
- Fargo, William G., 506 Union St., Jackson, Mich. Dec. to May, P. O. Box **874**,  
Pass-a-Grille, Fla. Tertiary mollusca.  
Fletcher, Mr. and Mrs. Howard L., 908 Crescent Ave. B, Redlands, Cal. Coll. *Murex*,  
*Olividae*, and *Calliostoma*.  
Flipse, Mr. and Mrs. Robert C., 80-56 Surrey Place, Jamaica 3, N. Y.  
Foody, Mrs. Mary R., 240 E. Durham St., Philadelphia 19, Pa.  
Ford, Rev. Paul D., R. D. 2, Sunbury, Pa.  
Foster, Richard Winslow, Museum of Comp. Zool., Cambridge, Mass.  
Fox, Ralph Olen, 1048 Monterey Ave., Berkeley 6, Cal.  
Frampton, Mr. and Mrs. Henry G., Box 1052, Miami 6, Fla.  
Franzen, Dr. Dorothea, Dept. of Biol., Washburn Municipal Univ., Topeka, Kan.  
Freeman, Mr. and Mrs. Harley L., 353 S. Atlantic Ave., Ormond Beach, Fla.
- Gardner, Fred, R. D., Jamesville, N. Y.  
Gardner, Dr. Julia, U. S. Geological Survey, Washington, D. C.  
Gaylord, Joseph S., East Longmeadow, Mass., and 521 5th St. N., St. Petersburg, Fla.  
George, Mrs. Henry, Jr., 7320 Watson Ave., Wauwatosa 13, Wis.  
Getz, Miss Dorothy, c/o Mrs. H. H. Gibbons, 418 E. Lake Ave., Baltimore 12, Md.  
Gifford, Dr. and Mrs., E. F., 2535 Le Conte Ave., Berkeley, Cal  
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# THE AMERICAN MALACOLOGICAL UNION

## CONSTITUTION ADOPTED 1931

1. This society shall be called "The American Malacological Union."
2. Its object shall be the promotion of the science of malacology by holding meetings for reading and discussion of papers, and for furthering the interests of students and collectors of shells by facilitating acquaintance and co-operation among the members.
3. Membership shall be limited to persons resident in the Americas and Hawaii. New members may be proposed by two members and balloted for by the Council. They shall pay an annual subscription (dues) of \$1.00. They will receive without other charge all notices, programs, lists of members, etc., issued by the Union.  
NOTE: In practice the Council ballots have been delegated to the Secretary.
4. The following officers shall be elected annually by ballot: President, Vice-President, two Secretaries and Treasurer.
5. The Union will be governed by a council consisting of the officers and four other members to be elected annually by ballot.
6. The annual meeting shall be held at such time and place as may be fixed by the preceding annual meeting. Other meetings may be called by the Council. Meetings of local branches may be held as such branches may determine.
7. Proposals for the alteration of this constitution when signed by five members and passed by the Council shall be acted upon at the next annual meeting. Concurrence of three-fourths of the ballots cast is necessary for any alteration.
8. The NAUTILUS is hereby designated as the official organ of the Union.

## RESOLUTIONS

That there be an honorary membership for such as have contributed in an outstanding way to American conchology.— Adopted May 26, 1932. (The late Charles Torrey Simpson, Bryant Walker, and Victor Sterki were honorary members).

That there be a corresponding membership for those not resident in the Americas.— Adopted May 26, 1932.

That the Council shall consist of the officers, honorary and past presidents, and members at large not to exceed four. Members of the Council present at any annual meeting shall constitute a quorum.— Adopted August 3, 1937.

That the Chairman of the Pacific Coast Branch be a Second Vice-President.— Adopted August 26, 1948.

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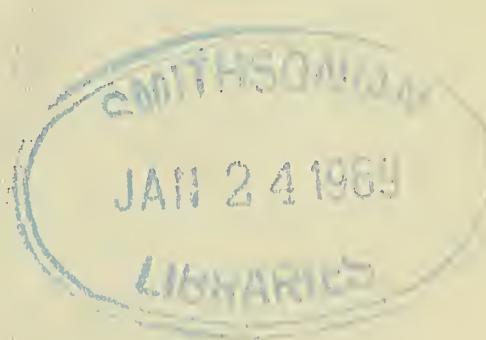
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# THE AMERICAN MALACOLOGICAL UNION



## News Bulletin and Annual Report

1950

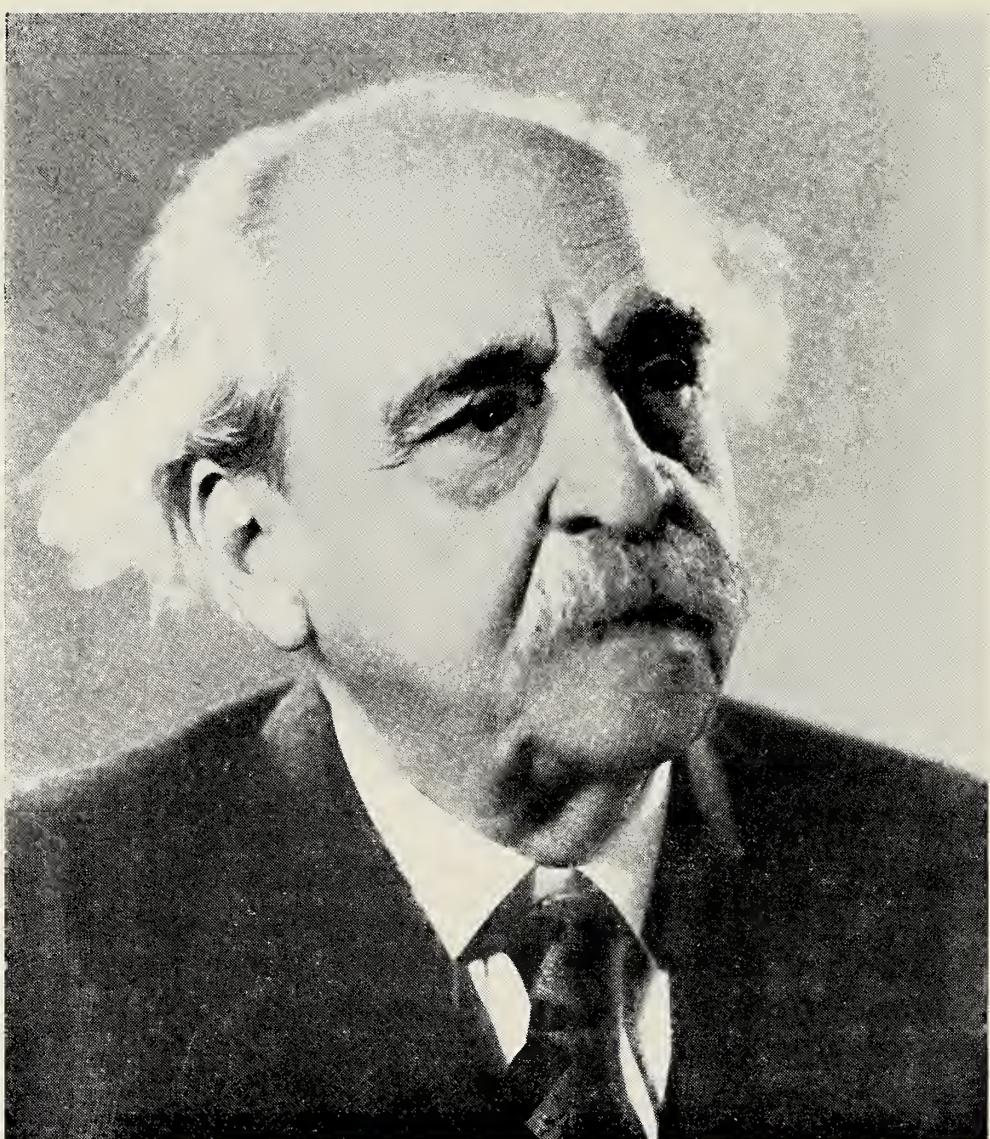


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December, 1950

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**Dr. Carlos de la Torre**

# CARLOS DE LA TORRE Y DE LA HUERTA

May 15, 1858 — February 19, 1950

PAUL BARTSCH

Don Carlos was born at Rio 37, Matanzas City, on the 15th day of May, 1858. He was the son of Bernabe de la Torre y Fernández, a native of Santiago de Cuba, and Rosa de la Huerta y Roque of Matanzas. Dr. de la Torre's father was a professor at the "Colegio La Empresa," and also its director. His father was also the founder of the schools "Los Normales" and "San Carlos" in Matanzas. Dr. de la Torre's mother was a daughter of Dr. Santiago de la Huerta, a lawyer of Matanzas.

At the age of 7, Don Carlos entered the primary grades of "La Empresa," and at 10 he entered the secondary school of "La Empresa." When "La Empresa" was closed for political reasons, he transferred to the Instituto de Matanzas, where he completed the second and third year. He studied here from 1869 to 1871. From this he advanced to "Los Normales," founded in 1870 by his father and other ex-Professors of "La Empresa." After graduating from this, he entered the Instituto de la Habana on a four-years' course. In 1872 to 1873 he interrupted these studies to assist Don Francisco Jimeno in establishing a museum at "Los Normales," thus following his bent in natural history. Here he also assisted G. Gysler in chemistry and taxidermy.

Resuming his studies in the Instituto de la Habana, he was graduated in 1874 as an outstanding student from that institution with the title of "Bachiller de Artes."

In October 1874, he entered the "Real Universidad de la Habana," subscribing to courses intended as a foundation for medicine and pharmacy, stressing physics, botany, zoology, and mineralogy. It was here that he fell under the influence of that eminent scholar and philosopher, Professor Felipe Poey, whose mantle was later to fall upon his shoulders. It was Poey who brought the flame kindled by Jimeno to a real blaze.

He finished the first and second year in medicine with high honors in 1875-6, and in these years he helped Dr. Babé and Dr. Ramón Forns in the Museum at the Academy of Sciences of Havana.

In 1877 he was forced, through illness, to interrupt his medical studies, and he returned to Matanzas, where among other subjects, he taught natural history in "Los Normales" and "San Carlos," being engaged at the same time in serious natural-history studies with Jimeno.

In 1880, he returned to the University and continued his studies in the third year of medicine and his second year in pharmacy, and at the same time he registered in thirteen subjects in natural history, all of which were completed with his major endeavors, in which he received the degree of Licenciado en Ciencias Naturales.

Don Carlos next went to Spain to enroll at the University of Madrid for the degree of Doctor en Ciencias Naturales, which degree he achieved November 1, 1883, having successfully defended the thesis "The Geographic Distribution of the Mollusk Fauna of Cuba;" published in Encyclopedia, Havana.

Having obtained his doctor's degree, he cast about for a teaching position. It so happened that at the time Puerto Rico was looking for a Professor of Natural History at the "Instituto." Don Carlos made an application for the position, and became the successful competitor, receiving the appointment December 22, 1883. He occupied this Professorship from 1884 to April 1, 1885.

In the meantime, the "Real Universidad de la Habana" held a competitive examination to fill the chair of Comparative Anatomy. In this examination Don Carlos again proved to be the successful candidate. He therefore left his position in Puerto Rico at the end of the scholastic year, April 1885, to assume his new duties at the "Real Universidad de la Habana." This made him an associate of his much admired Professor Poey. At the University he taught various subjects attached to his Department in addition to Comparative Anatomy, among them Mollusca and Zoophyta and the Systematic Zoology, including Vertebrates, Articulates, Mollusca, and Zoophytes.

In 1896 his leaning toward the independence of Cuba caused him to be dropped by royal order from the rolls of the "Real Universidad de la Habana." During this banishment he accepted the tutorship of young Luis Estevez, the son of Luis Estevez and Marta Abreu. With this family he visited various parts of Europe during the Cuban Insurrection, stressing the museums in most countries of Europe except Spain. This brought him in contact with many of Europe's foremost naturalists, especially the leaders in malacology.

At the close of the revolution, when Cuba had achieved its independence, he returned to the island and was reinstated at the University of Havana in January, 1899, as head of the Department of Comparative Anatomy, with various other topics previously attached thereto. To these subjects were also added Geology, Petrography and Palontology, as well as Evolution of Plants and Animals.

The reorganization of the University in 1900 enabled him to drop most of the subjects, concentrating his endeavors upon Comparative Anatomy, Biology, and Zoology.

While engaged in teaching at the University of Havana he enrolled in studies leading to certain degrees. Of these the degree of Doctor of Pharmacy was bestowed upon him in 1921 and Doctor of Medicine in 1922.

The Department headed by him expanded steadily, requiring still further rearrangement, and in 1934 his personal endeavors were devoted to General Zoology, both Vertebrate and Invertebrate, and Zoogeography.

In 1936 the University honored him by making him Emeritus Professor which gave him more time for research in his chosen field, Mollusca, to which he had been wedded since his boyhood days with Jimeno.

His broad knowledge of science and humanity made him an important figure in the administration of the University affairs, where he occupied the position of Dean of the School of Science and Letters, 1920-21. From this he was advanced to the Presidency of the University in 1921, which position he filled until 1923, greatly acclaimed by faculty, student, and the general public.

The Department of Letters and Science being separated, he was appointed Dean of Science in 1930, 1933, and 1935.

His success as teacher is well attested by the faculty positions now occupied by his students, among which we may mention:

A. Mestre and Carlos Garcia Robiou in Anthropology

Victor Rodriguez in Biology

C. G. Aguayo, Pedro J. Bermúdez, Luis Howell and Abelardo Moreno in Zoology

R. de la Torre in Paleontology

J. Fernández de la Arena, in Comparative Anatomy

all of whom are now Professors at the University.

To these must be added the many leaders teaching in the educational institutions scattered through the island who began by kindling their torch in his classroom in 1874 and continued to do so for 75 years, carrying the flame to the farthest corners of the island.

In addition to his University endeavors he occupied numerous civic positions in the island, among which should be mentioned:

1901—July to January 1902, he served on the Mayor's Council of Election at Habana.

1902—He was elected Mayor of Habana on January 8, assuming the duties of that position January 17, and continuing in that office until the 30th of May, when he was elected by the Province of Habana to serve as a representative on the First Constitutional Assembly for the Establishment of a Cuban Republic. In this Assembly he was chosen President.

1934—He became President of the Council of State and Member of the Council of Secretaries by Presidential appointment.

1934-49—He was the Director of the Department of Biology of the Technical Council of the Institute Finlay.

During his many years of service Don Carlos was frequently charged with representing his government at various important scientific meetings in various parts of the world. Some of these duties were:

1890—He was called to head a Committee to investigate Pre-Columbian man in Puerto Rico, Santa Domingo, and Oriente, and secure material for an exhibit covering this subject, to be shown at the World's Columbian Exposition in Chicago, Illinois, U.S.A.

1895-7—During the duration of Cuba's War of Independence Dr. de la Torre studied the collections at the Museums of Natural History in Paris and London, which enabled him to rectify many erroneous concepts in nomenclature.

1903—He spent from June to September at the Exposition installing the collection and serving as a judge on the Jury of Awards in Geology and Mines. (The collections then exhibited are now housed in the Academy of Science and University of Havana.)

1904—He was sent as Commissioner of Public Instruction to the Exposition at St. Louis, Missouri, U.S.A. and to Washington and Philadelphia to renew scientific relations.

1906—He served as Official Delegate of the Cuban Government at the Tenth International Congress of Geology held in Mexico City, Mexico.

1910—He served as Cuban Official Delegate at the Eighth International Zoological Congress held at Graz, Austria, in August, and he also served as Official Cuban Delegate to the Eleventh International Geological Congress at Stockholm, Sweden, in September. Here he delivered a paper on the discovery of the Jurassic at Viñales, Pinar del Rio Province, Cuba, and on the Discovery of Mammalian fossils at Jatibonico, Camagüey Province, Cuba.

He also visited the University of Madrid, Spain, his Alma Mater, to study Poey's extensive Manuscript on Cuban Fishes.

1912—He represented Cuba at the Commencement Celebration of Harvard University. At these exercises he was the recipient of the Honorary degree of Doctor of Science.

1920—He visited the U. S. National Museum, Washington, D. C., to discuss nomenclatorial problems pertaining to Cuban Ichthyology to rectify Poey's MS. Also to study Cuban land shells in the Museum's collection.

1925—He again visited the Museum for similar purposes.

- 1927—He again returned to the University of Madrid and brought Poeys Manuscript on Cuban Fishes which had been deposited in that Institution to Havana. This consisted of four volumes. To these he has added a supplemental volume with nomenclatorial corrections and explanations and additions to that memorial paper. These wonderful plates and texts appear to have reached page proof, but their issue has unfortunately been held up for lack of funds.
- 1932-3—He was exiled from Cuba during her trying political disturbances, spending part of his time at the University of Miami, working over their molluscan collection and part of the time at the American Museum of Natural History in New York City and the U. S. National Museum at Washington, D. C., where he was similarly engaged.
- 1936—He attended the meeting of the American Malacological Union at St. Petersburg, Florida, where he was elected Vice-President.
- 1937—He visited the Museum at Pittsburgh, Pennsylvania, and attended the meeting of the American Malacological Union at Ann Arbor, Michigan, where he was elected President of the Union, after which he visited the Steinheil Aquarium which was to serve as an example for a Cuban Aquarium, and also made inquiries of publishers as to printing his color plates of Cuban fishes that will supplement the Poeys Manuscript at Chicago, Illinois.
- 1938—Saw the memorable meeting of the American Malacological Union at Havana, Cuba during Don Carlos' Presidency of the Union. Here its members were entertained by the Cuban government. Not only that, but they were carried to the island from Key West, Florida, and returned to that port by an official Cuban vessel. The program presented and its field strips were as outstanding as the Cuban hospitality.
- 1939—Don Carlos attended the meeting of the American Malacological Union at Toronto, Canada, and then spent the rest of the summer at Washington studying with Dr. Bartsch.
- 1940—Official Delegate of the Cuban Government and President of the Cuban Commission to the Eighth American Scientific Congress at Washington, D. C.
- 1941—Don Carlos attended the meeting of the American Malacological Union at Rockland, Maine, U.S.A., then spent the rest of the summer at Washington, working on the Cuban Land Mollusk Manuscript of the family Annularidae.

## PAPERS PUBLISHED ON CUBAN MOLLUSKS BY DR. DE LA TORRE

“Distribucion geografica de los moluscos terrestres de Cuba”  
published by the “Revista Enciclopedia”, Habana.

- 1909—“Descriptions of two new Cuban Land Shells”, *Nautilus*, volume 23, pp. 49-50, pl. 4.
- 1911—“New Cuban Urocoptides”, *Nautilus*, volume 25, pp. 42-48.
- 1912—“New Cuban Urocoptis of the *U. cinerea* Group”, *Nautilus*, volume 26, pp. 55-58.
- 1912—“New Cuban Urocoptis of the *U. cinerea* Group” continued, volume 26, pp. 66-69.
- 1914—“A New Cuban Species of *Brachypodella*”, *Nautilus*, volume 28, p. 5.
- 1920—“A New Opisthosiphon from Cuba” by Carlos de la Torre and John B. Henderson (privately printed).
- 1921—“New Mollusks from Camaguey and Santa Clara Province, Cuba, by Carlos de la Torre and John B. Henderson, Proc. U. S. National Museum, volume 59, pp. 247-267, pls. 38-42.
- 1930—“New Cuban Urocoptidae”, by Dr. Carlos de la Torre, Proceedings of The Academy of Natural Sciences of Philadelphia, volume 81, pp. 443-447, and figures.
- 1930—“Two New Varieties of *Urocoptis livida*”, by Dr. Carlos de la Torre and William J. Clench, *Nautilus*, volume 44, pp. 15-16.
- 1932—“New Cuban Cerions”, by Dr. Carlos de la Torre, *Nautilus*, volume 45, pp. 89-91.

- 1932—"Some New Cuban Urocoptis" by Carlos de la Torre, *Nautilus*, volume 45, pp. 86-89.
- 1936—"The Cuban Operculate Land Shells of the Subfamily Chondropominae", by Dr. Carlos de la Torre and Paul Bartsch, *Proc. U. S. National Museum*, volume 85, no. 3039, pp. 193-403, figs. 71-101, pls. 7-39.
- 1938—"A new Cuban Polydentes", by Dr. Carlos de la Torre, *Nautilus*, volume 52, pp. 37-38.
- 1939—"Notes on the type of *Helix (Helicogona) gilvus* Ferussac", by Dr. Carlos de la Torre, *Nautilus*, volume 52, pp. 77-78.
- 1941—"The Cuban Operculate Land Mollusks of the family Annulariidae exclusive of the subfamily Chondropominae", by Carlos de la Torre and Paul Bartsch, *Proc. U. S. National Museum*, volume 89, no. 3096, pp. 131-385, plates 9-57.
- 1942—"The Cyclophorids Operculate Land Mollusks of America", by Carlos de la Torre, Paul Bartsch, and Joseph P. E. Morrison, *Bull. 181, U. S. National Museum*, pp. 1-306, pls. 1-42.
- 1942—"A Revision of the Classification of the Operculate Land Mollusks of Cuba belonging to the Family Annulariidae and a List of the known species and sub-species", by Carlos de la Torre and Paul Bartsch, *Proceedings of the Eighth American Scientific Congress*, Washington, volume 3, *Biological Sciences*, pp. 335-379.
- 1943—"Nueva subspecie de *Zachrygia petitiana* (d'Orb.), by Carlos de la Torre y Huerta and Abelardo Moreno, *Memorias de la Sociedad Cubana de Historia Natural*, volume 17, pp. 59-60, text figs. and pls. 5-6.  
 "A Monograph on the Genus *Polymita*", by Carlos de la Torre and Abelardo Moreno (in print).  
 "The Cuban Terrestrial Mollusks of the Family Urocoptidae", by Carlos de la Torre and Paul Bartsch, M.S. completed, pp. ?, 54 text figs. and 69 pls.

### A FEW OF THE HONORS THAT HAVE BEEN CONFERRED ON DON CARLOS

- Sociedad Española de Historia Natural. 1883 y 1910.
- Académico de Mérito de la de Ciencias Medicas, Pínicas y Naturales, Havana. Nov. 11, 1910.
- Socio de Mérito y Medalla commemoration de la Soc. Cubana de H. N. Mayo 15, 1918.
- Socio de Mérito y Diploma especial de la Sociedad Económica, el 9 de Enero de 1923.
- Socio de Honor de la Sociedad Geográfica de Cuba, el 7 de Junio de 1926.
- Honorary Life Member of the American Museum of Natural History. New York, Oct. 18, 1911.
- Doctor of Sciences, Honoris Causa: "Carolum de la Torre y Huerta, rerum naturae publicarumque peritum, inter molluscarum sinus Mexicani investigatores primum, qui conchis priscis effosis historiam sub terranearum Cubae penitus novavit. "Pres., Lowell. Senatus Collegii Harvardiani Academicus. Cantabrigiae, Mass., Junii XX. MDCCCCXII.
- Corresponding Member (Limited to 22) of The American Museum of Natural History (1923-1928). "because of active interest in scientific research." N. Y. Feb. 5, 1923. Osborn, Pres.
- Miembro de la Academia Imperial Alemana de Naturalistas de Halle. June 15, 1926.
- Vice-President de "The American Malacological Union" 1931. Electro en St. Petersburg, Fla. 1936.
- Gran Cruz de Carlos Manuel de Cespedes. Condecorado por el Pres. C. Mendieta. Abril 1935.
- Chevalier de L'Ordre National de La Legion d'honneur. Paris, de 29, Mai, 1936. Condecoration.
- Medalla de Oro y Diplome de Honor de Hijo Predilecto de la Ciudad de Matanzas. Abril 7, 1913.
- Presidente de la Soc. Cub. de Hist. Nat. "F. Poey".
- Presidente de Honor de la Soc. Malacologica "C. de la Torre".
- Miembro de Honor de la Soc. Cubana para la Protección de la Naturaleza.

How well Don Carlos' molluscan studies have been recognized is evidenced by his election to the Presidency of The American Malacological Union as well as the creation of Sociedad Malacologica "Carlos de la Torre" at the University of Havana. He was largely responsible for the purchase of the Gundlach collection and its installation at the Institute of Havana. Likewise does he deserve credit for the establishment of the Museum at the University of Havana. He also provided a fine collection of mollusks to the Centro Superior Tecnológico at Ceiba del Agua, and later sponsored a small museum at Galiano Street, Havana, which was open to the public not only in the day time, but enabled the rank and file to enjoy viewing its treasures during their leisure hours in the evening up to ten at night and during holidays, a feature not made possible by any other institution. I was greatly impressed by the interest shown by the visitors and the splendid attendance during a number of evening visits made by me to this little Museum, which gave great pleasure to Dr. de la Torre.

At his home Don Carlos was subjected to an endless number of calls from persons seeking his advice or help. These constant interruptions, to which he lent a sympathetic ear, cut deeply into the studies in progress. To gain time for his work, he developed an ingenious arrangement of his daily hours, which consisted of sleeping through most of the forenoon, attending to classes or meeting his callers in the afternoon, and working upon his favorite studies—the mollusca—from the close of day to the wee small hours of the morning. This was a marvelous arrangement for an ever busy man, but a bit trying to his partner, who was not infrequently found napping after the hour hand had passed the midnight point.

I doubt if in the entire island of Cuba there was another man so universally known and beloved as Don Carlos. His work in preparing text for primary and secondary schools had carried his name into every home in the island, while his genial personality and lovable disposition made him beloved and welcome wherever he tarried in his extensive expeditions in the field.

Ofttimes, on our collecting trips, I was impressed with his approach to the rural community. Having identified himself by asking the youngsters surrounding us, whose text book they were using, he would point out to them that he was the man who had written it. He thus at once became the marked man to whom the young and old flocked. Explaining that he was in quest of land shells, he would turn the place into a veritable collecting camp, and caused it to be scoured for specimens. Many sharp eyes and willing fingers soon amassed a lot of everything the region had to offer. Not only that, but in many instances many collectors were produced who continued to send to Don Carlos material for years to come. Some especially gifted entered his services to collect in places beyond their home-horizon.

It was Don Carlos' genial, stimulated personality that caused students to flock to his courses at the University, carrying from its portals his profound interest in the things of the out-of-doors to the farthest reaches of the island.

All of this resulted in a continuous flood of material being sent to the Professor as an appreciative return for the interest in the out-of-doors which he had kindled in their hearts. This eventually resulted in the amassing of his unrivalled collection.

**THE AMERICAN MALACOLOGICAL UNION  
SIXTEENTH ANNUAL MEETING  
CHICAGO, ILL., JUNE 14, 15, 16, 1950**

Conchological history was made in Chicago when, on June 14th, 1950, the American Malacological Union, represented by 36 delegates, assembled for the sixteenth annual meeting on the second floor of the Chicago Natural History Museum. It was, according to Dr. Fritz Haas, president and host, the first time that so many malacologists had been together in that great city. They came from ten states, the District of Columbia, Argentina, Egypt, and Israeli. By noon nearly every one had arrived, and although the convention was not officially opened until one o'clock, the Council meeting was held during the forenoon, and at lunch hour the long table reserved in the Museum cafeteria was the scene of much informal discussion.

A most comfortable and adequate meeting room had been provided, and there the first session was called to order by Dr. Haas who voiced his personal welcome, adding that he proposed to keynote the coming sessions with the admonition, "Enjoy yourselves." He then introduced Colonel Clifford C. Gregg, Director of the Chicago Natural History Museum, who echoed the greeting of Dr. Haas, observing that individuals or scientific groups are always welcome at the Museum. He praised the work of Dr. Haas, but said that neither of them is satisfied with the museum collection of mollusks, but that they share the eternal hope of all museum curators, that of increased appropriations.

Dr. Paul Bartsch responded to Colonel Gregg, expressing gratitude in the name of the organization, for the opportunity of meeting at the museum and appreciation of the planning which had provided such excellent facilities. He urged patience and persistence in the struggle for an improved museum collection.

Dr. Howard E. Gloyd, Director of the Chicago Academy of Arts and Sciences, was next introduced. He spoke briefly of Frank Collins Baker with whom a goodly number of his listeners had enjoyed personal acquaintance and friendship. Dr. Baker was a versatile man, unusually well-informed and an inspiration to his fellow-workers. His association with the Chicago Academy of Arts and Sciences lasted from 1894 to 1918 from which time until his death in 1942 he was affiliated with the University of Illinois. During both of these periods he produced much written material.

Dr. Haas added a brief personal tribute to Dr. Baker and then made several announcements. He relayed the invitation from Dr. Jeanne S. Schwengel to a cocktail party to be held the following evening, announced the offer of Dr. Harley J. Van Cleave on behalf of the University of Illinois to furnish copies of Baker's monograph, "The Molluscan Family Planorbidae," at a forty per cent reduction in price on orders placed during this meeting, and said that the Friday field trip would be to the Indiana Dunes and must be made by train.

The minutes of the Council meeting were read, incorporating the treasurer's condensed financial report and the secretary's report. The following

panel of nominated officers was presented: President, Dr. Joseph P. E. Morrison, Vice-President, Dr. Jeanne S. Schwengel; Treasurer, Harold R. Robertson; Secretary, Mrs. Harold R. Robertson; Councillors-at-large, Dr. Carlos G. Aguayo, Dr. Joseph C. Bequaert, Dr. G. Dallas Hanna, Dr. A. Byron Leonard. Election of this panel was unanimous. Dr. Leo G. Hertlein, Chairman of the Pacific Division of the Union becomes Second Vice-President. An invitation received from the Buffalo Society of Natural Sciences to hold the 1951 meeting in the Buffalo Museum of Science, Buffalo, N. Y., was presented and unanimously accepted.

Dr. Henry van der Schalie was asked to report on the *Nautilus* index, a project which has been several years in the making. It is now completed, and plans for the publication are being considered. Individual support of A. M. U. membership is absolutely essential, with perhaps a degree of financial backing from the Union treasury. This latter had been tentatively guaranteed by the Council. It was a large undertaking, much exhaustive and painstaking labor went into it, and it should not be shelved at this stage.

Dr. Joseph P. E. Morrison presented the first paper.

## AMERICAN ELLOBIIDAE — AN ANNOTATED LIST

J. P. E. MORRISON

In this geographic analysis of American species, the classification based on genitalia and radular characters, with generic separations based on minor radular details, advocated by Odhner (*Aikin-f-Zool.* 17A, No. 6; Stockholm, 1925) is followed. Fortunately for the great majority of molluscan students for whom radular studies may not be practical, the shell differences readily observable upon critical examination corroborate these anatomic group distinctions. In other words, shell studies alone will suffice for the identification of the 12 genera and 41 species known from American shores.

The extremely wide geographic distribution of certain species of Ellobiids, points to either a very effective means of dispersal at some point in the life history of the individual, or a long continued dispersal in geologic time, or both. Will the systrophic nucleus of the adult shells of the Ellobiidae eventually be explained by the discovery of a pelagic larval stage? The life history of members of this family is still almost completely unknown. Even the simplest observations on populations, rate of growth, or discovery of the eggs of any species will be important in filling this blank in our scientific knowledge.

### Family ELLOBIIDAE

#### Subfamily MELAMPODINAE

##### Genus MELAMPUS Montfort 1810

**Melampus bidentatus corneus** (Deshayes) 1830: Prince Edward Island, E. Canada, to Staten Id., N. Y.

**Melampus bidentatus lineatus** Say 1822: New Jersey to North Carolina, inclusive.

**Melampus bidentatus bidentatus** Say 1822: South Carolina to Florida and Texas; Tampico; Belize; Bahamas; Cuba; N. W. Jamaica; Gonave Id., Haiti; Tortola Id.?

**Melampus bidentatus redfieldi** Pfeiffer 1854: Hungry Bay and South Shore, Bermuda Islands.

**Melampus coffeus** (Linnaeus) 1758: Florida; Bahamas; Cuba; Jamaica; Hispaniola; Puerto Rico; Culebra Id.; St. Thomas; Tortola; Antigua.

**Melampus olivula** (Moricand) 1844: Bahia, Brazil.

**Melampus olivaceus** Carpenter 1856: Terminal Id., San Francisco, Cal. to Mazatlan, Mexico.

**Melampus piriformis** (Petit) 1842: Costa Rica to Ecuador and the Galapagos Islands.

#### Genus PIRA H. & A. Adams 1855

**Pira monile** (Bruguiere) 1789: Bermuda; S. Florida; Bahamas to islands off Honduras; N. Colombia; Cuba to Barbadoes.

**Pira tabogensis** (C. B. Adams) 1852: San Lucas Id., Costa Rica, to Panama and San Jose; Pearl Islands; Cocos and the Galapagos Islands.

#### Genus DETRACIA Gray 1840

**Detracia floridana** (Shuttleworth) 1856: Delaware and Chesapeake Bays; E. and W. Florida; Gulf coast to New Orleans, Louisiana.

**Detracia clarki** Morrison 1951: Florida Keys, Miami to Key West; Abaco Id., Bahamas (drift); Punta Cajon (N.W.) and Cayo Perro, Cardenas Bay, Cuba.

**Detracia bullaoides** (Montagu) 1808: Bermuda; Fernandina to Key West and Cedar Keys; Florida; Bahamas; Cuba; Jamaica; Hispaniola; St. Croix; Tampico, Mexico.

**Detracia parana** Morrison 1951: Amazon River, Para, Brazil.

**Detracia strigosa** (Martens) 1900: Rio Coto, Golfo Dulce, Costa Rica.

**Detracia joseana** Morrison 1946: Panama and San Jose, Pearl Islands.

**Detracia graminea** Morrison 1946: Panama and San Jose, Pearl Islands.

**Detracia globula** (Orbigny) 1837: Panama and San Jose, Pearl Islands, to Colombia and Guayaquil, Ecuador.

#### Genus TRALIA Gray 1840

**Tralia ovula** (Bruguiere) 1789: Bermuda; Florida Keys; Bahamas to Jamaica; Belize; Br. Honduras; Ruatan Id., Honduras; Sabanilla, Colombia; and Cuba to Barbadoes.

**Tralia panamensis** (C. B. Adams) 1852: San Lucas Id., Costa Rica to Panama and San Jose; Pearl Islands.

**Tralia vanderbilti** Schwengel 1939: Chatham Island, Galapagos.

#### Subfamily PEDIPEDINAE

##### Genus PEDIPES Ferussac 1821

**Pedipes ovalis** C. B. Adams 1849: Bermuda; Miami to Key West and Tortugas, Tampa Bay and Shell Key off St. Petersburg, Florida; Andros, Royal and Cay Sal Ids., Bahamas; Cuba; Jamaica.

**Pedipes mirabilis** (Muhlfeld) 1818: Daytona (?), Lake Worth and Upper Matecumbe Key; Florida; Jamaica; Hispaniola; Puerto Rico; St. Thomas; St. Kitts; Barbadoes; Sabanilla, Colombia.

**Pedipes unisulcatus** Carpenter 1866: San Pedro, Catalina Id., and San Diego, Cal. to Lower California and mouth of Yaqui River, Mexico.

**Pedipes liratus** W. G. Binney 1860: Lower California and the Gulf of California.

**Pedipes angulata** C. B. Adams 1852: Panama City and Taboga Island, Panama.

Genus MARINULA King 1832

- Marinula succinea* (Pfeiffer) 1854: Florida; Bahamas; Cuba; Jamaica.  
*Marinula rhoadsi* Pilsbry 1910: Lower California, Mexico.  
*Marinula concinna* (C. B. Adams) 1852: Panama and San Jose, Pearl Islands.  
*Marinula reclusiana* Petit 1842: Humacao Island, Colombia.  
*Marinula acuta* (Orbigny) 1835: Guayaquil, Ecuador.  
*Marinula pepita* King 1832: Isla de Chiloé, Chile.  
*Marinula juanensis* Odhner 1925: Masatierra, Juan Fernandez Islands.

Genus LAEMODONTA Philippi 1846

- Laemodonta cubensis* (Pfeiffer) 1854: Bermuda; Florida Keys; Bahamas; Cuba; Jamaica; St. Thomas; Barbadoes.

Genus APODOSIS Pilsbry and McGinty 1949

- Apodosis novimundi* Pilsbry and McGinty 1949: Florida Keys; Bahamas; (Cuba?); Jamaica.

Subfamily PYTHIINAE

Genus PHYTIA Gray 1821

- Phytia myosotis borealis* (Conrad) 1833: Castine, Maine to Staten Island, New York.

- Phytia myosotis marylandica* (Pilsbry) 1900: Patuxent River, Maryland; Shell Bay, W. of Chincoteague Id., Accomack Co., and Willis Wharf and Fisherman's Id., Northampton Co., Virginia.

- Phytia bermudensis* (H. & A. Adams) 1854: Bermuda Islands.

- Phytia setifer* (Cooper) 1872: Juan de Fuca, Washington, to Catalina Island, California.

- Phytia infrequens* (C. B. Adams) 1852: Panama.

- Phytia reflexilabris* (Orbigny) 1837: Callao, Peru.

Genus BLAUNERIA Shuttleworth 1854

- Blauneria heteroclita* (Montagu) 1808: Alabama; Florida; Bahamas; Cuba; Jamaica; Hispaniola.

Subfamily CASSIDULINAE

Genus MICROTALIA Dall 1894

- Microtralia occidentalis* (Pfeiffer) 1854: Bermuda; Florida; Bahamas; Cuba; Jamaica; Hispaniola.

Subfamily ELLOBIINAE

Genus ELLOBIUM Röding 1798

- Ellobium pellucens* (Menke) 1830: Florida; Isle a Vache, Haiti; Yucatan; N. Venezuela; British Guiana; French Guiana.

- Ellobium stagnalis* (Orbigny) 1835: El Salvador; Costa Rica; Panama and Pearl Islands; Cocos and Galapago Islands; Humacao Id., Colombia; Guayaquil, Ecuador.

As he closed Dr. Morrison observed that his study of this group has raised more questions than it settled. "I wish that every one would look for these embryonic snails in plankton; we need to find the youngest *Melampus* ever."

Mr. Gordon K. MacMillan presented the second paper.

## A TRIP TO THE GREAT FALLS OF THE POTOMAC GORDON K. MACMILLAN

Approximately 16 miles northwest from the heart of Washington, if the Capitol Building can be thus designated, there is to be found one of the most striking scenic features within the vicinity of the National Capitol—the Great Falls of the Potomac. The broad and calm stream that flows by Potomac Park narrows suddenly above the city, cutting, at frequent intervals, deep gullies consisting of enormous boulders of granite and jagged reefs of gneiss, over which the turbulent water cascades majestically. Another interesting feature of the Potomac Gorge is its peculiar situation biologically. In the cool shadows of the steep cliffs the biota of the upland region impinges upon that of the coastal plain to furnish one of the most productive fields for biological study in the east. This productive field in biology, combined with the scenic beauty of the Great Falls of the Potomac, lured seven Conchologists to visit that region over 40 years ago for the purpose of collecting mollusca.

Sometime in May, 1910, Dr. Denry A. Pilsbry, Dr. Paul Bartsch, Dr. Wm. Healey Dall, Dr. George H. Clapp, Dr. Bryant Walker, John B. Henderson, Jr., and Thomas H. Aldrich travelled to the Great Falls in a caravan consisting of two of the most modern automobiles of that day.

Ten lantern slides were used to illustrate this paper, showing the various members of the party at different places in the Potomac Gorge. Nine additional pictures, many duplicating somewhat the slides, had been pasted on a piece of cardboard and passed around the audience for examination.

Two of the pictured participants, Dr. Bartsch and Dr. Pilsbry, were among Mr. MacMillan's appreciative audience. Dr. Bartsch commented, "Never did have a better time! Henderson organized the trip." Dr. Pilsbry remarked, "I am certainly surprised to see these pictures here. You might call this a pre-A. M. U. meeting. We once went to Cape Fear, North Carolina, and on that trip Walker's sister went along."

## "THE MOLLUSKS INHABITING SOME TEMPORARY POOLS AND PONDS IN ILLINOIS AND OHIO

RALPH W. DEXTER  
(Abstract)

Mollusks were collected from temporary pools and ponds in East Central Illinois and Northeastern Ohio between 1935-50. A total of 208 vernal ponds were examined, 23 in Illinois and 185 in Ohio. Altogether, 137 of these, 67% of the total, were found to contain mollusks. Observations were made during the dry seasons at certain stations, but most of the collecting was carried out in the spring months. Pools of very diverse size, depth, and type of habitat were examined over varying lengths of time. Seventeen species of gastropods and 3 genera of sphaeriids were collected. Mollusks were not usually abundant in these temporary bodies of water with a few exceptions. As many as 8 species have been collected from one pond although seldom were all present at any one collection. The dry seasons are apparently spent under cover where the soil is kept moist, or they burrow into the ground.

Dr. Dexter's paper was illustrated by color slides picturing various ponds during several seasons. He gave a list of species found with degree of abund-

ance and explained that taking the mollusks was incidental to his real purpose, that of collecting Fairy Shrimp. Dr. Pilsbry asked if any observations were made as to the length of time the mollusks lived after the pool dried up, having found that adult snails tend to bury themselves in mud and come up when it rains. Dr. Dexter replied that he visits some ponds each month the year round, making it a practice to visit them all in the month of March. Some dry up for 4 months each summer, but how deep the mollusks go he was unable to say; they always are on hand the following spring. Dr. Van Cleave said that repopulation of pools has been thoroughly studied and reported on.

The next paper was by Dr. Paul Bartsch, "Carlos de la Torre y de la Huerta," the text of which appears elsewhere in this report. As the paper was read a large portrait of Dr. de la Torre was thrown upon the screen. Viewing the benevolent features of this great man made even more poignant the realization of his loss to the malacological world.

The afternoon session was completed with this paper, and since the annual dinner, scheduled for seven o'clock, would not begin for nearly four hours there was ample time for the devotees of foot travel to return to the hotels by following the sidewalks which border Chicago's beautiful Outer Drive. The Chicago Natural History Museum is fortunate in its pendantlike setting in the curving necklace of lake-bordered boulevards.

The banquet was held in a private dining room on the tenth floor of the Stevens Building and was enjoyable both socially and gastronomically. It was the only bargain in a most expensive city; for it is a memorable occasion when \$2.50 buys fillet mignon at its finest, plus excellent service and pleasant surroundings. Dinner over it was delightfully relaxing to sit back and listen to the several speakers and to Dr. Bartsch who is at his genial best in the role of Toastmaster.

Before beginning his introductions he requested a moment of silence in memory of those three fellow-members who had departed this life during the past year: Mr. Dan L. Emery, Dr. T. C. Stevens, and Dr. Carlos de la Torre. He also asked for signatures from every one present to be sent as greetings to Imogene and Harold Robertson and to Dr. Louise M. Perry, all unable to be present and sadly missed.

Dr. Haas was first presented, responding to Dr. Bartsch's question as to why he returns each year to Bermuda by saying that each time he finds new and more complex problems to be worked out, and that he is endeavoring to learn their pattern if not their solution, the better to instruct his followers how to undertake them.

Dr. Bartsch observed that Dr. Haas bears triple responsibility, for besides his work in Bermuda he is laboring to keep Chicago to the fore in the malacological field and to carry on Frank Collins Baker's work as investigator and teacher. He then asked Dr. Morrison why he seeks problems in the far corners of the globe such as Bikini. Are there no problems left to solve at home?

Dr. Morrison replied that problems are everywhere, and that lessons learned in one's own back yard may be applied to quite a different subject half a world away. And there never is enough time. He once spent eight months in the islands of Panama and came away with much left unseen and many questions unanswered. The Bikini trip was an example of looking into other back yards, of asking the old questions about new things, and of recognizing the ever present and growing need for more study, more attention to data and detail. There is a vast field for study on embryonic Cypraeidae which

he believes go through a planktonic stage which may explain the erratic distribution. Dr. Morrison concluded by relating his experience with some gustatory tidbits which included roast breast of noddy bird and steamed *Hippopus maculatus* which possesses the chewing qualities of a rubber boot.

Dr. Bartsch next asked Dr. Jeanne Schwengel, "How did you become interested in malacology?" Dr. Schwengel explained that a combination of circumstances brought it all about. Her natural inclination to be a "saver" plus finding an abundance of shells on her first visit to the Sanibel beach brought about an effort on her part to collect them all. This was followed by her acquaintance with Dr. Louise M. Perry, who advised discrimination and study. In an attempt to follow this advice she consulted Dr. Bartsch, who also advised study; by the time that she reached Philadelphia and had gained an audience with Dr. Pilsbry her quest for knowledge had so sharpened her resolution that she refused to be sidetracked, and when at last she was able to convince Dr. Pilsbry that her interest was genuine and her intention to study sincere, he agreed to act as teacher and councilor. Their association has lasted for thirteen years, and in closing Dr. Schwengel thanked her good friend and teacher for his kindness and patience and said that to him and to Dr. Perry goes the credit for anything she has accomplished or may hope to accomplish in the field of malacology.

Dr. Bartsch observed that he was sorry to have mistaken scientific zeal for idle curiosity when approached by Dr. Schwengel so many years before. He next called on Dr. Henry Pilsbry, describing him as the Dean of American Malacology, and asked him to relate the wonderings of a shell vagabond.

Dr. Pilsbry, recently returned from a trip to South America, said that the United States offers more to the shell hunter, both in quantity and variety, than does any other place in the western hemisphere with the exception of the West Indies. For instance, in Argentina a few local species of land shells may be very prominent in one place, a quite different lot in the next valley, with but little intergradation. Around Buenos Aires land shells are somewhat scarce but the aquatics are more numerous, especially in the broad, shallow reaches of the Rio de la Plata. Minute shells such as are common in the United States are almost entirely missing in the Argentine. A huge *Pomacea* occurs where the lower slopes of the Andes merge with the borders of the Grand Chaco, and two of these made the long trip back to the States, passing customs and immigration inspectors with ease since they reposed in a deep dark pocket; they now reside in an aquarium in Philadelphia. Dr. Paradiz of the Buenos Aires museum was present at the dinner, and Dr. Pilsbry praised his work as well as that of his associate, Dr. Carcelles; they have a magnificent collection of mollusks there, though it may be somewhat lacking in comparative material.

As he concluded, Dr. Bartsch observed that Dr. Pilsbry never draws upon his imagination, and said that he wished that the same might be said of others, especially of some authors of molluscan literature. He next introduced Dr. Harley J. Van Cleave.

Dr. Van Cleave declared that he had wormed his way into malacology; his primary study had been of parasitic worms, and at one period, feeling himself in somewhat of a rut, he took up the study of *Pleurocera acuta*. He gave up in disgust when he found his snails infected with *Acanthocephala*, the very thing he had thought to get away from.

Dr. Elmer G. Berry, next introduced, spoke briefly of his study of Schistosomiasis which has absorbed all of his time in recent years; having just re-

turned from Puerto Rico where he tested chemicals in the program of Schistosomiasis control being conducted. He plans to leave very soon for Africa on another phase of this important study.

Dr. Henry van der Schalie was presented, his topic, "Making Future Malacologists." He asserted that the schools today can do much by steering those groping for a lasting interest into the field where so much waits to be done. The colleges turn out hundreds of biology students, but relatively few of these go into zoology—perhaps one or more probably none into malacology. He thinks that the public needs to be instructed, interested and finally steered into this work. Much worthwhile work is accomplished by the so-called amateurs, and we need more of them, too.

Dr. Pilsbry observed that we have not as many amateurs doing active work as there are in England or Germany, and agreed that the public needs to be informed and enlisted in the work.

This completed the list of speakers, and the hour was late; Dr. Bartsch suggested that a rising vote of thanks to Dr. Haas for his efforts in organizing such an enjoyable affair was in order, and the company rose as one man to tender a deserved ovation and end a memorable evening.

The first session of the second day was called to order at 9:30 and the opening paper was read by Dr. van der Schalie, who explained that it was not his own but the work of a graduate student at the University of Michigan, Dr. Irving Kagan. "Notes on Leucochloridium."

This paper was accompanied by slides and movies, relating the story of the infestation of *Succinea retusa*, which as the intermediate host for this trematode, harbors the brood sacs in the tentacle; the swollen, banded tentacle, later throbs or 'pumps' to attract the attention of the birds which serve as final host (in this case, the coot, or gallinule). The brood sacs containing metacercariae are snapped up by the bird and thus an amazing cycle is completed. The colored slides were most interesting, portraying vividly the banding and the abnormal swelling, while the movies recorded the pulsations and the understandable lethargy of the snail. The fact that infected snails were more inclined to remain in open sunlight than non infected snails was not explained.

He closed with a plea that anyone observing this condition in *Succinea* send the infected snail at once to Ann Arbor. Please send them alive, packed in moist *Sphagnum* or wet tissue in a ventilated box.

## SOME ASPECTS OF THE ECOLOGY OF STENOTREMA HIRSUTUM (SAY) IN THE REGION OF ANN ARBOR, MICHIGAN

CHARLES BRUCE LEE

In March, 1949, a field program was undertaken to determine more fully some of the aspects of the ecology of the terrestrial pulmonate, *Stenotrema hirsutum* (Say) in the region of Ann Arbor, Michigan.

With the use of pH indicators and careful observations on moisture and light, careful notes were recorded to expand the ecologic needs of this species in such a way so as to elaborate more fully on the short coverage of Baker (1934).

The program was carried out with coverage of four areas in the immediate vicinity of Ann Arbor, Washtenaw County, Michigan. Three of the areas yielded populations of the species while the fourth lacked any representation.

The presence or absence of the animals in any area seemed to be tied intrinsically to the acidity or alkalinity of the soil. Moisture and sunlight play additional and equally important roles. With limited equipment though, it was only possible to measure the chemical constitution of the soil. The light and moisture were recorded from sight observation.

On the basis of this study it was concluded that in these areas studied *Stenotrema hirsutum* (Say) occurs on soil that is rich in lime as indicated by a pH range that is decidedly alkaline.

Further the animals lie in situations that are associated with down timber, rotting logs, boards and bark chips.

Also the best habitats appear to be flood plains just above the high water mark of neighboring streams.

And finally, the best colonies are found in sparsely wooded regions that permit considerable sunlight to fall on the zone inhabited by these snails.

This paper was accompanied by slides. Dr. Morrison: "Do both low and upland forms of *S. hirsutum* occur in Michigan?" Answer: "Perhaps, but I have only found the lowland type." Mr. George Beatty: "Do any snails take kindly to pine areas?" Answer: "Not as a rule, but *Anguispira alternata* was found abundant under these conditions during the field trip of the eleventh annual meeting of the A.M.U. at Rockland, Maine."

Several announcements were made at this time, and wires were read from the absent Robertsons (Mr. and Mrs. Harold R. Robertson) in Buffalo, and from R. Tucker Abbott, who sent greetings from Zanzibar.

Dr. A. Byron Leonard, "Mulluscan Faunas and Climatic Changes in the High Plains Provinces"

This paper was accompanied by slides which portrayed the general topography of Kansas, which Dr. Leonard said has been gradually undergoing a drying-up process as proved by the abundance of aquatic fossil mollusks at ever-higher levels.

Dr. Dexter: "Was this drying-up continuous, or did it perhaps alternate?" Answer: "We cannot be sure; due to erosion it is a hard thing to determine." Dr. Morrison: "How much attention has been given to the ecology of Pupillidae; for instance, do they live in the grass roots?" Answer: "No effort has been made in that direction; the Pupillidae on the Great Plains live in grassy ravines, except *Pupoides albilabris* (*Pupoides marginatus*). These, by the way, the red ants collect for us, use them with coarse sand to build their hills. *Vertigo* exists locally in artesian areas in the southeast section of Kansas." Dr. Morrison: "How about *Gastrocpta cristata*. We have several in the National Museum, but none collected alive." Answer: "In our area it occurs in great profusion."

Mr. Robert W. Reese, "The Pearly Mussels of the Marais des Cygnes River, Kansas." (Mr. Reese is at present working on the Kansas State Biological Survey on a Fellowship.)

Colored slides of collection stations and of the mussels taken were shown. Mr. Lee: "Of course you recognize the important part that fish play in this cycle; have you made a survey that ties fish species in?" Answer: "Yes, we are doing that." Dr. Morrison: (Referring to the mention in the paper of the rapid rise and fall of the river) "Once while collecting in the Merrimac River I found clams at shoulder depth; next day the water had risen to six feet and collecting was over." Dr. van der Schalie: "Reese is doing good work. River

biology is changing so fast that such surveys are most important if only to serve as a record." Dr. Morrison: "With the building of the TVA dams, the Tennessee River must needs keep up fauna as best it can with but *one mile* left undisturbed. It is very farsighted of the state of Kansas to back a state survey."

This paper was the concluding one of the forenoon session, and following lunch group photographs of the entire assemblage and of the Council were made on the museum steps.

Dr. Bartsch opened the afternoon session with his paper, "Columellar Armature of Cuban Urocoptid Land Shells." He called attention to the fact that the monograph of the Cuban Land Mollusks of the family Urocoptidae by Dr. de la Torre and himself is completed. It embraces 1,748 pages of manuscript, in which 803 species and subspecies are described, as well as quite a number of new superspecific groups. Two figures of each described form are given—1,606 in all. They are placed on 68 plates. In addition to this 54 text figures of columellar structures of the superspecific groups are included in the monograph. Of these Dr. Bartsch showed lantern slides with accompanying remarks.

He also stated that the monograph will be prefaced with a portrait of Don Carlos de la Torre, and that the introduction presented brief accounts of the men who have contributed to the taxonomy and reference to the species and superspecific groups named by them, as well as references to the persons whose names have been attached as specific designations to forms here treated.

This paper was accompanied by slides, revealing in detail the intricate and amazing series of patterns in the internal structure of these snails. Dr. van der Schalie: "How did you prepare the shell when you made these slides?" Answer: "One side was cut off by using a fine file and whetstone." Mr. Lee: "How could you be sure you were not dealing with genetic classes?" Answer: "We first considered the radula as well as the nuclear and external characteristics." Dr. Haas: "You have opened a new world to us all." Dr. Morrison: "Dr. Bartsch used an idea of mine in this study; he had a large lot of very confusing species from Eastern Cuba; I finally persuaded him to make a radular study, and he found that he had two kinds only, each group fell neatly into place." Emile Abdel-Malek: "How do you prepare radulae?" Answer: "If the radula is not easily extracted, boil the animals in water to soften them, or, in the case of fresh material, boiling in water on cleaning the shell leaves the radula at least partly separated from its membranes, so that it may be extracted with forceps. If the radula is not absolutely clean, it may be boiled in strong potassium hydroxide solution (KOH). After rinsing to remove KOH it may be stained directly in the water solution of mercurochrome, or perhaps a better stain may be Prontosil dye. You will have to learn the time of staining for each type of radula by experiment and examination. Usually the radula cannot be overstained because it destains only too readily in the alcoholic solutions to follow. Transfer through a quick series of alcohol changes, using only 75%, 95%, and absolute, and timing the changes to give just the right amount of destaining. From absolute alcohol the radula is placed directly in xylol to clear.

Heat a drop of balsam on the slide over an alcohol lamp until it smokes a little and becomes hard. Place the radula on this mound of hardened balsam with a tiny drop of xylol. It is while the radula is being arranged on and in this hardened balsam that dissecting needles are used to tear apart an entire radula sufficiently to separate either the individual rows along the torn edges or to separate individual teeth. Warming over the alcohol lamp after this

teasing process will remove almost all, if not all, the air bubbles produced by working in the semihard balsam. The next step is simply to put a cover glass on the semi-solid balsam and very carefully melt or soften the balsam to draw the cover glass down to the plane of the slide."

Dr. Elmer G. Berry, "Method of Raising Snails at the National Institute of Health."

This paper was accompanied by slides showing interior of snail-rooms banked with tanks. Emile Abdel-Malek: "In raising snails at Ann Arbor, we use a broad-leaved aquatic plant (*Vallisneria*) which provides broad surfaces upon which eggs may be deposited, rather than the fern you illustrate. And why do you not use sand in the bottom of your tanks, since the snails need it for digestive purposes?" Answer:: "We find gravel better for plant roots, and enough sand is always present in that to serve the needs of the snails." Dr. van der Schalie: "Do you make a study of size in relation to food?" Answer: "Yes, our snails are much larger than those raised in a natural but less favorable environment; we weed out the weaklings and keep our crop suited to their accommodations." Emile Abdel-Malek:: "Stunted snails have been found less susceptible to infection by the miracidia of *Schistosoma mansoni*; and why do you stop aeration during feeding?" Answer: "We find that aeration tends to drive the food into crevices in the gravel. And in answer to your observation, we usually choose normally raised snails for our exposure experiments." Dr. van der Schalie: "Do you keep records on your snail culture?" Answer: "Yes indeed, complete records." Dr. Bartsch: "Never has a scientific laboratory had such a set-up as that described by Dr. Berry. I move that the AMU go on record as complimenting the far-sighted men who have been instrumental in approving the appropriations needed to carry out this work, and that the secretary be instructed to draft a letter to that effect." This motion was seconded and carried.

Dr. Haas: "This completes the scientific part of our program, and again I thank you one and all for coming."

Dr. Bartsch spoke for the attending members and for the AMU as a whole in expressing warmest gratitude to the museum, and to Dr. Haas in particular for making the 1950 convention an unqualified success.

The remainder of the afternoon was spent by many in further exploration of the museum, while others visited the Shedd Aquarium which is immediately adjacent to the museum grounds.

At 6:30 in the Stevens Hotel Dr. Jeanne Schwengel and her husband, General Frank R. Schwengel, greeted the members as their guests at a cocktail party and buffet supper. It was a delightful occasion, for the Schwengels entertain with a lavish hand. With good food and good companions, the enjoyable evening will not be soon forgotten.

The field trip which completed the convention program took place on Friday, June 16th; Dr. Haas and two of his staff accompanied Leon Aboulafia, Charlotte Dawley, Gordon MacMillan, Ernest Noyes and Margaret Teskey to the Indiana Dunes, forty miles northeast of Chicago.

The trip was made by train which afforded opportunity to observe possible reasons for the ever growing scarcity of molluscan life in this area. Many streams were crossed and most were visibly polluted; some bore an iridescent skum of oil, others were most unsightly with floating garbage and trash-strewn banks. Clearings which surrounded thousands of rural homes were in many cases themselves surrounded with signs of recent brush fires, boding ill for the

snails which once flourished there. It was not until the train neared the ultimate destination of the excursion that the area gave promise of haven for molluscan fauna.

Indiana Dunes State Park is a quiet retreat, combining a wooded area with dune and beach; picnic facilities are provided, and it must be a favorite spot to many Chicago people. A most enjoyable day was spent there, and a wearisome walk was averted when Mr. Noyes' son appeared at an opportune time to transport the party (in relays) to the beach and later back to the train.

A return to the city found it nearly devoid of malacologists; the meeting was officially over, and not until August, 1951 shall we convene again. Farewell, Chicago, and thanks! Hail, Buffalo!

Respectfully submitted,

MARGARET C. TESKEY,  
Secretary pro tem

## MEMBERS AND VISITORS IN ATTENDANCE

Emile Abdel-Malek, Ann Arbor, Mich.  
Leon R. Aboulafia, Tel Aviv, Israeli  
Dr. Paul Bartsch, Washington, D. C.  
George D. Beatty, Sandusky, Ohio  
Dr. Elmer G. Berry, Bethesda, Md.  
Dr. and Mrs. E. Carl Cahn-Bronner, Chicago, Ill.  
Miss Charlotte Dawley, Greensboro, N. C.  
Dr. Ralph W. Dexter, Kent, Ohio  
Dr. and Mrs. Fritz Haas, Chicago, Ill.  
Harold W. Harry, Ann Arbor, Mich.  
Mrs. W. F. Hodges, Gary, Ind.  
Charles Bruce Lee, Ann Arbor, Mich.  
Dr. and Mrs. A. B. Leonard, Lawrence, Kan.  
A. S. Koto, Beloit, Wis.  
Miss Adele Koto, Beloit, Wis.  
Gordon K. MacMillan, Pittsburgh, Pa.  
Dr. J. P. E. Morrison, Washington, D. C.  
Mr. and Mrs. Charles Nelson, Grand Rapids, Mich.  
Ernest H. Noyes, Chicago, Ill.  
Juan José Paradez, Buenos Aires, Argentina  
Dr. Henry A. Pilsbry, Philadelphia, Pa.  
Mrs. Lulu C. Pollak, Chicago, Ill.  
Mr. and Mrs. Robert W. Reese, Lawrence, Kan.  
Eugene S. Richardson, Jr., Chicago, Ill.  
James M. Ross, Ann Arbor, Mich.  
Miss Katherine Schiro, Tampa, Fla.  
Dr. Jeanne S. Schwengel, Greenwich, Conn.  
Alan Solem, Chicago, Ill.  
Dwight W. Taylor, Ann Arbor, Mich.  
Miss Ernestine Taylor, Tampa, Fla.  
Mrs. Margaret M. Teare, Buffalo, N. Y.  
Mrs. Margaret C. Teskey, Buffalo, N. Y.  
Dr. Harley J. Van Cleave, Urbana, Ill.  
Dr. Henry van der Schalie, Ann Arbor, Mich.

# **MINUTES OF THE THIRD ANNUAL MEETING OF THE AMERICAN MALACOLOGICAL UNION PACIFIC DIVISION**

The third annual meeting of the AMUP was held in the Del Norte Room of the Barbara Hotel in Santa Barbara, California, April 7 to 9 inclusive, 1950. Registration was held in the hotel lobby at 1:30 P.M., April 7. In all fifty-eight persons were present at this meeting.

The meeting was called to order at 2:15 P.M., Friday, April 7, 1950, by John Q. Burch, the chairman. Mr. Burch officially welcomed the members and guests who were present. Mrs. E. P. Chace, the program chairman was thanked for her efforts in arranging so fine a program. Mrs. John Q. Burch, the reservations and arrangements chairman received a vote of thanks. Miss Ruth Coats expressed her regrets for being unable to preside at our 1949 meeting because of illness.

Mr. Burch appointed Miss Ruth Coats, Andrew Sorensen, and Mr. Phil Spicer to serve as a nominating committee.

Among the persons introduced at this time were Miss Margaret C. Irwin of the Santa Barbara Museum of Natural History; Merton E. Hinshaw of the Pacific Grove Museum; Don M. Wilson, president of the Pacific Coast Shell Club; George P. Kanakoff and Dr. Howard R. Hill, both of the Los Angeles County Museum.

The first paper was by Andrew Sorensen, "Exemplified Discussion of Shell Development in Marine Mollusks." This paper was illustrated by actual examples of forms under discussion. There were further comments by A. G. Smith, W. O. Gregg, and E. P. Chace.

## **EXEMPLIFIED DISCUSSION OF SHELL DEVELOPMENT IN MARINE MOLLUSKS**

**ANDREW SORENSEN**

**(Abstract)**

Mollusks, crustacea, echinoderms, and insects have an outer shell that serves to protect the soft internal organs. They are without vertebrae, ribs or other internal bones and are therefore called invertebrates. On the other hand, the higher forms of life do not need an outer shell for they have an inner skeleton and are therefore called vertebrates. To this group belong mammals (of which man is the highest form), reptiles, birds, and fishes. The shell development of mollusks varies greatly. Among the freshwater varieties several produce living young with the shell fully developed, such as *Vivipara malleatus* (Reeve), introduced here from the rice fields of southern China. Ordinarily marine mollusks lay eggs, often by the millions. Upon hatching, the larvae are free swimming for a shorter or greater time before they settle to the bottom. Then some of them become sessile, such as oysters and mussels. Clams dig into the sand or mud while most of them become free moving on the bottom.

Bivalves, or pelecypods have two shells connected by a hinge and held together by strong muscles. Univalves, or gastropods have but one shell. It forms from the nucleus, or spire, spiraling generally to the right, called dextral, and becoming larger with each whorl till maturity. Most of the species maintain the same general form during their development, and can therefore readily be identified, while some few are entirely different in form and color in youth

than in maturity. Thus, the *Strombus* resembles *Conus* in youth and the *Pteroceras* gradually develops long spines or legs on the outer lip, giving it the name of scorpion shell. Many other strange and beautiful forms exist.

The next paper, "Exotic Mollusca in California", was by Dr. Howard R. Hill, Curator of Zoology of the Los Angeles County Museum.

## EXOTIC MOLLUSCA IN CALIFORNIA

DR. HOWARD R. HILL

(Abstract)

Exotic mollusks have been accidentally or intentionally introduced into the State for many years. Some have found conditions favorable and become pests. Among these are *Helix aspersa*, *Theba pisana*, and *Otala lactea* which was first found in California in 1940.

Government campaigns to eradicate *T. pisana* and *O. lactea* have been quite successful. On the other hand, the European Brown Snail, *H. aspersa* and slugs of the genera *Limax* and *Deroberas* have been difficult to eradicate. The Giant African Snail, *Achatina fulica* has been intercepted at the American entry ports but individuals of this species have not been encountered elsewhere.

Exotic freshwater univalves have become established in many places but have proven harmless.

Most of the exotic marine mollusks have been introduced in shipments of seed oysters from Japan and the Atlantic Coast. One mussel, quite similar to the Japanese *Mytilus dunkeri* has multiplied rapidly in the bays of Southern California. The Atlantic Coast clam, *Mya arenaria* has become well established in San Francisco Bay.

The concluding paper on the afternoon program was by Dr. Joshua L. Baily, Jr., entitled "The Taxonomy of the Gastropods." The complete text of this paper appeared in Minutes of the Conchological Club of Southern California, 99: 4-8.

The speaker did not attempt to formulate a taxonomic system for the gastropoda, but merely pointed out the fundamental defects in all the old ones. Classification must be based upon structural resemblances, and these can arise in three ways: First, they may be inherited from a common ancestor, in which case they indicate true evolutionary relationship among the species exhibiting them. Second, they may be adaptive modifications arising in unrelated groups living in a common environment, in which case they have no taxonomic value whatever, and third, they may be primitive characteristics inherited from a remote ancestor, brought into prominence by the degeneration and atrophy of later developed structures that might have served to discriminate the groups possessing them had they been preserved.

Now all the structures relied upon in the classification of gastropoda seem to belong to this last group. Thus the nervous system in primitive gastropods consists of two primary loops, but in more highly specialized forms one of these has disappeared. The gills and auricles were primitively paired, but one of each has disappeared, and the surviving gill has lost one of its two primitive pectinations in the highly specialized forms. Also the most complex radulae occur in the most primitive forms. In one tribe, the taenioglossa, there are only seven teeth in each row, but in all probability these seven are not homologous throughout the tribe, so that this group is possibly of polyphyletic origin.

The speaker felt that the radula offers the best clue to the ancestry of gastropoda, but that it cannot be utilized for this purpose until the homologies of all of its components are understood.

The evening session was called to order at 8 P.M., at which time Allyn G. Smith talked on "Rediscovery of the Farallon Islands." His interesting talk was illustrated by a series of lantern slides.

Following Mr. Smith's paper, Mr. Spicer showed us a series of lantern slides taken on a trip to Guaymas, Mexico. Mr. Hinshaw then showed color pictures of land snails from Monterey County. This concluded our evening session.

The meeting reconvened Saturday morning at 9:45 with a short business session. It was moved by A. Sorensen that the minutes of our 1949 meeting be approved as published. This motion was duly seconded and carried. The financial report was read and approved.

Dwight Taylor was introduced and gave us a short report on things conchological at the University of Michigan. It was stated that the second section of the index to the Nautilus was ready to go to press but about 300 more subscribers will be necessary in order to finance its publication. A committee, consisting of A. G. Smith, Joshua Baily, John Burch, and Ruth Coats was appointed to solicit additional subscribers for this index. At this time 35 additional subscriptions were pledged by members present.

Mr. Spicer gave brief remarks on *Cypraea tessellata* Swain. This was followed by presentation of a paper by Walter Eyerdam, "Some Notes on *Placostylus*".

## SOME NOTES ON PLACOSTYLUS

WALTER J. EYERDAM  
(Abstract)

*Placostylus* occurs in the Melanesian province which includes the periphery of what is supposed to have been a subcontinent in geological ages past. It is the site of the fabled continent of Moo.

This genus does not occur in Australia but is found on Norfolk Island as well as North Island, New Zealand. It does not live in New Guinea or its island satellites but occurs on most of the larger islands of the Solomons and New Hebrides Islands. New Caledonia is the center of distribution and apparently the core of the former lost continent. *Placostylus* does not extend to the north to the Bismarck or Admiralty Islands but extends to the east to the Fiji and Harvey Islands.

The heaviest shelled *Placostylus* species live on New Caledonia but the largest that I know is one that I collected at Kira-Kira on San Cristoval Island called *Placostylus cleryi* Petit. It is 122 mm in length and lives on the confervae in high tree tops about 150 feet from the ground. Many species are terrestrial.

About 45 species and subspecies of this genus are known to date from the Solomons. Of these I have collected 22 species while engaged as ornithologist on the Whitney South Sea Expedition, 1929-30.

At least three-fourths of the species in the Solomons live on Malaita, San Cristoval and the tiny island of Santa Anna. On Malaita and San Cristoval Island, Dr. Paravicini found four new species and I found four more new species of *Placostylus*.

Malaita Island, if well explored, should yield many more species of this genus. It is however a difficult problem because the natives are generally

hostile and it is a very dangerous undertaking and unpredictable as to consequences.

The Reverend Fox is the only white man that is allowed free travel on Malaita at present. He has been a missionary down there most of his life and is highly respected by the natives.

(The complete text of this paper appeared in Minutes of the Conchological Club of Southern California, 103:1-3.)

Next followed a paper by Dr. A. Myra Keen, "Species of the Cardiid Genus *Clinocardium*."

## SPECIES OF THE CARDIID GENUS CLINOCARDIUM

DR. A. MYRA KEEN

(Abstract)

This genus of the Cardiidae is distinguished from all others of the family by the prosogyrate beaks. Ribs are well developed but never spiny. There are at least 19 species, of which only three have not been recorded as fossil. Thirteen are known only as fossils, and three are both fossil and living forms. The range is from southern California northward to the Arctic, westward to Japan, and eastward in the Arctic to Spitzbergen. However, only one species occurs in the Atlantic, all the rest being either Japanese or West American. The genus originated in the Miocene in California. Species are distinguished from each other on the basis of number of ribs, shape of ribs, and shape of shell. This group has been confused with *Cerastoderma*, which differs in its orthogyrate beaks, its weaker hinge, and its smoother ribs. True *Cerastoderma* is restricted to the Atlantic, living today only in Europe.

After a short discussion the meeting was adjourned.

The meeting reconvened at 2 P.M. Dr. A. Myra Keen presented a paper entitled "Ancestral History of the Living Brachiopoda." This paper was illustrated by a number of drawings and photographs.

## ANCESTRAL HISTORY OF THE LIVING BRACHIOPODA

DR. A. MYRA KEEN

(Abstract)

The Brachiopoda—which resemble mollusks in being two-valved—are among the earliest invertebrates preserved as fossils. The very earliest genera survived only a short time, geologically, but *Lingula*, which developed a little later in the early Paleozoic, holds the record among animals for longevity, living unchanged in form from Upper Ordovician to the present. Many thousands of species of brachiopods flourished in the Paleozoic, some with large and elaborate shells. Specialists classify them in hundreds of genera and scores of families which are grouped into about 20 superfamilies. Of these, only six have survivors into the Tertiary and the present. There are about 30 living species of brachiopods on the West Coast of North and Central America, representing five of the six living superfamilies. Most of the species of the world are members of the superfamily Terebratulacea, which comprises 44 genera and about 125 species.

Brachiopods generally inhabit deeper water off-shore, for their inability to move about makes competition with clams and other invertebrates difficult. The lingulacea, however, are mud dwellers, near shore in quiet bays.

The second paper of the afternoon session was presented by Ernest N. Wilcox, "Conchology in My Own Backyard."

## CONCHOLOGY IN MY OWN BACKYARD

ERNEST N. WILCOX

(Abstract)

This is a study of mollusks occurring in one city lot in San Luis Obispo, California, where the author has lived for the past ten years. In all thirteen species have been found and their habits studied—one water snail, four land slugs, and eight land snails—*Helisoma tenue californiense* Baker, *Deroceras agreste* (Linn.), *Limax flavus* Linn., *Limax marginatus* Müller, *Milax gagates* (Drap.), *Helix aspersa* Müller, *Helminthoglypta umbilicata* (Pilsbry), *Helminthoglypta walkeri* *morroensis* (Hemphill), *Oxychilus draparnaldi* (Beck), *Zonitoides arboreus* (Say), *Hawaiia minuscula minuscula* (Binney), *Punctum conspectum conspectum* (Bland), and *Vallonia excentrica* Sterki.

The egg-laying habits of some of the land slugs and larger land snails have been observed during the warmer months.

*Helix aspersa* and the land slugs have been annoying pests and though the writer has waged constant war on them there are always survivors left to carry on the struggle.

(This paper appeared in Minutes of the Conchological Club of Southern California, 100:1-3.)

There was a ten minutes intermission during which time a group picture was made by a local photographer.

After intermission, Allyn G. Smith presented an illustrated paper, "Fusinidae of the West Coast of North America".

The meeting was adjourned following Mr. Smith's paper.

At 8 P.M. we reassembled in the Del Norte Room for the Annual Banquet. Forty-eight members and guests were present.

The Sunday morning session was called to order by Mr. Burch. Miss Ruth Coats, chairman of the nominating committee announced the following candidates to hold office for the following year: Dr. Leo G. Hertlein, chairman; Dr. W. O. Gregg, vice-chairman; Allyn G. Smith, secretary-treasurer. It was moved and seconded that nominations be closed and the secretary was instructed to cast an unanimous ballot for those nominated.

A report of the expenses of this meeting was submitted by Mrs. Burch. It was moved by Dr. Keen that the secretary write to the management of the Barbara Hotel, thanking them for their courtesy in making their facilities available for our meeting. This motion was seconded by Mrs. Chace and duly carried.

The first paper of this session was presented by Dr. Leo G. Hertlein, "Pearl Oysters of the Gulf of California."

## PEARL OYSTERS OF THE GULF OF CALIFORNIA

DR. LEO G. HERTLEIN

(Abstract)

Pearls have been found in western North America and elsewhere associated with fossil shells of bivalve mollusks which lived in the seas millions of years ago. Indians in the Gulf of California used the soft parts of pearl oysters for food and early explorers in that region observed piles of empty shells along the shores. The presence of pearls in the Gulf of California is said to have been reported in Mexico City by the crew of Grijalva's ship which touched at La Paz in 1534. Shortly thereafter fishing for pearls began and has continued ever since.

Two species of pearl oyster occur in the Gulf of California, *Pinctada mazatlanica* Hanley (concha de perla) and *Pteria sterna* Gould (concha nácar). The region was famous for the pearls which it yielded, not only those of silvery color but also those colored gold, pink, green and black. The beds in shallow water were soon depleted and on the arrival of pearl divers in 1685 those at greater depths also suffered depletion. Pearls became somewhat scarce by 1736 but later the introduction of the use of the diving suit, invented by August Siebe, made it possible to reach much greater depths. Gradual depletion followed. Gastón J. Vives, a native of La Paz, discovered a method of cultivating the large pearl oyster (*Pinctada*). This gave promise of a revival of the pearl industry, but the revolution of 1914 put a stop to this development. Since then apparently there has been no noticeable improvement in the status of this once important industry.

The second paper was by Dr. W. O. Gregg, "Collecting Land Snails in Southeastern Arizona."

## COLLECTING LAND SNAILS IN SOUTHEASTERN ARIZONA

DR. W. O. GREGG  
(Abstract)

The topography of southern Arizona is particularly marked by parallel mountain ranges separated by intervening arid mesas. These ranges lie in a general north and south trend. The intervening arid mesas serve as absolute barriers to the large land snails. This isolation is said to have been initiated during the Pliocene. Thus isolated, each mountain range usually has its own particular molluscan fauna.

The mountains of the southeastern portion of Arizona, particularly the Huachucas and the Chiricahuas, are especially rich in species. In many cases a species is confined to a single canyon and its tributaries. In one instance each slope of a canyon has its own fauna with three distinct forms not found elsewhere. Outstanding genera are *Sonorella*, *Oreohelix*, *Ashmunella*, and *Holospira*. While *Sonorella* extends as far north as the Grand Canyon and westward nearly to the Colorado River, it has its greatest concentration of species in the southeastern part of the state. *Oreohelix* s. s. extends south to the Huachucas and Chiricahuas and a short distance below the Mexican boundary. *Radiocentrum*, a subgenus of *Oreohelix* which is also found in southern New Mexico and northern Mexico, extends to the northwest as far as the Chiricahua Mts. where two species and two subspecies are found. *Ashmunella*, with the same general distribution, extends further west and is found in the Huachucas while *Holospira* is found as far west as the Santa Cruz River. In addition to these larger land snails there is a large number of minute forms of the genera *Thysanophora*, *Microphysula*, *Euconulus*, *Retinella*, *Zonitoides*, *Striatura*, *Vitrina*, *Discus*, *Helicodiscus*, *Radiodiscus*, *Gastrocopta*, *Chaenaxis*, *Vertigo*, and others.

Before the researches of Ferris, Pilsbry, Daniels and others which began in 1902, this snail fauna was practically unknown. At that time there were no topographic maps of this area. Travel was often slow and difficult.

During the past two years three trips to this area have been made by Mr. M. L. Walton and myself. Excellent topographic maps are now available. We found good roads where once collectors had been forced to travel on foot. In locating type localities, we were frequently annoyed by finding earlier roads and even town sites which had been long abandoned. This is particularly true

in the mining districts. We have found the latter part of March and early October the best times of the year for trips to this part of Arizona. New roads are being built and most of the older ones are being constantly improved. In addition to the numerous published collecting localities, there is still plenty of new territory left to be explored.

There followed a paper entitled "The Upper Pleistocene Fauna of Newport Bay Mesa" by George Kanakoff. This paper was illustrated by well prepared maps and charts.

## THE UPPER PLEISTOCENE FAUNA OF THE NEWPORT BAY MESA

GEORGE P. KANAKOFF  
(Abstract)

Our deposit at the end of Newport Bay Estuary is unique in many ways. It not only includes representatives from the Plant Kingdom and every phylum of the Animal Kingdom, but covers a range of species now living from Panama to Alaska, from deeper water species to those of mud flats and some fresh-water species, much mammalian material of marine and land origin, and an unusual amount of the remains of aquatic birds.

This deposit was first reported by Mr. and Mrs. F. L. Grouard of Santa Ana, California, in July, 1940. It aroused great interest because of more of the warm-water, extra-limital species than are usually encountered in Palos Verdes sands. Several trips were made and several hundred pounds of the screened material were collected from four localities. The material was already picked, sorted, and separated into generic groups when the World War II took the writer away from the Museum. During the war Mr. George Willett finished the study of the material, described 6 new species and a few new records for the Pleistocene Mollusca and wrote a paper on them. When the writer returned to the Museum in 1945, Mr. George Willett had passed on. The work was continued by weekly trips, and several new rich exposures were opened, which exceeded all previously known in abundance and variety of material, especially the bone material of mammals and birds. Our deposit there (LACMIP 66-2) is by far the richest, and we think—the champion.

Protozoa. Our micropaleontologist found over 40 species of Foraminifera ranging from Miocene to Recent. Because of extensive redeposition it is impracticable to use this information to extend our knowledge of the deposit.

Porifera and Coelenterata. Sponges and corals are few and not yet determined.

Bryozoa. Dr. Raymond Osborn of the Hancock Foundation has determined about 39 species of Bryozoa of which there are:

Species known from the Pleistocene to Recent.....	8
Species known as Recent (not known as fossils).....	12
Species known from Miocene to Recent.....	3

The geographic range of the majority of species reaches Mexican waters. Brachiopoda are represented by two species.

Annelida. There seem to be 4 or 5 species of marine worms not yet determined.

Echinodermata are represented by 8 species. It is interesting to mention among them *Diadema mexicanum* and *Mellita longifissa*.

Arthropoda. There are 8 species of barnacles and one of a moth. (There was found a two-inch piece of branch of *Encelia californica* Nutt., mineralized at both ends with a characteristic gall of *Carolella buskana* Comstock, 1939, a

species of moth.) The study of the abundant crustacean material is not completed, but Mr. Robert J. Menzies, Research Fellow of the Hancock Foundation so far has separated and identified 15 species of the following families: Inachidae, Callinassidae, Cancridae, Gonoplacidae, Zanthidae, Portunidae, and Grapsidae.

In Mollusca we found unprecedented number of species (376 or more) which are distributed as follows:

Amphineura .....	10 sp.
Pelecypoda .....	126 sp.
Scaphopoda .....	6 sp.
Gastropoda .....	229 sp.
Pteropoda .....	1 sp.
Pulmonata .....	2 sp.
Fresh Water .....	6 sp.
New Species .....	6 sp.
Extra-limital .....	40 species— 9.5 percent
Extinct species .....	14 species— 3.7 percent
New records .....	30 species— 12.6 percent

Ecologically they are:

Shallow water .....	52 percent
Estuarine and mudflat.....	37 percent
Deep water .....	11 percent

Arranged by midpoint of their geographic distribution, expressed in northern latitudes most of the species fall between 14 and 50. A midpoint of the whole deposit—31.8. A numeric distribution chart, which the writer intends to publish, shows clearly that this deposit is a significant link between the fauna of Palos Verdes sand and that of the Magdalena Bay deposit.

In the Chordata bones were found in number unusual for any marine deposit. Separate papers are being prepared by specialists. Among the distinguishing features are:

- (a) Fragments of a large turtle plastron.
- (b) Some 50 odd specimens of identifiable bird bones belonging to 15 species of shore birds.
- (c) Among the identifiable mammalian bones there were *Megalonix*, *Tenupolama*, *Tapirus*, and *Equus cf. occidentalis*—all of them not represented in the Rancho La Brea fauna.

The concluding paper on this program was by Mr. E. P. Chace, "Some Notes on *Neverita*".

### SOME NOTES ON NEVERITA

E. P. CHACE

(Abstract)

A historical sketch telling of the use of the names *Neverita reclusiana*, *N. r. imperforata*, and *N. alta* by various authors and the results of a comparative study of 250 specimens of *N. reclusiana* and 50 specimens of *N. alta* showing that *N. alta* is a good species but that the callus patch over the umbilicus on some specimens of *N. reclusiana* closely resembles the callus patch of *N. alta*. This is interpreted as an overlap of a single character rather than an intergradation, each shell can be correctly placed by observing the other characters.

In his closing remarks Mr. Burch again expressed his thanks to the various committee members whose efforts had resulted in so fine a program. It was

requested that all speakers submit abstracts of their papers to the secretary.

On behalf of the members of the AMUP, Mrs. Joshua Baily expressed appreciation for the work of the officers and committee chairmen in conducting this meeting.

Thus ended our third annual meeting. We had all been registered in the one hotel. The Del Norte Room, where all the meetings were held, was large and perfectly equipped with the entrance directly from the lobby on the ground floor. Time between sessions was busily spent talking conchology and becoming better acquainted with each other. Many visited the Santa Barbara Museum of Natural History and other near-by places of interest but for most of us the time was much too limited and our only regret that it was all over too soon.

WENDELL O. GREGG,  
*Secretary-Treasurer*

## OUR MEMBER CLUBS

**The Boston Malacological Club, Margaret F. Farrell, Secretary-Treasurer:** The Boston Malacological Club had a very successful 1949-1950 season, with meetings on the first Tuesday of each month from October through May at the Massachusetts Audubon Society Library, 155 Newbury Street, Boston, at 8 p. m. As several members of the club are affiliated with the Museum of Comparative Zoology, the most up-to-date information on mollusks is available to the members.

The following was the program for the year: October, 1949, A report of summer activities of members; November, "Mollusks from an Engineer's Point of View," by Dr. William A. Clapp, Clapp Laboratories, Duxbury, Mass.; December, "Ten Days on a Beam Trawler," John Foster, Plymouth, Mass.; January, 1950, "Marine and Land Shells of Puerto Rico," William J. Clench, Curator of Mollusks, M. C. Z.; February, "Mollusks and other Invertebrates as Morticians," Dr. Joseph Bequaert, Curator of Insects, M. C. Z.; March, "Propagation of *Mya arenaria* Linne," Harry J. Turner, Jr., Biologist, Woods Hole Oceanographic Institution and Charles L. Wheeler, Biologist, Div. of Marine Fisheries; "Coloration on Living and Fossil Shells," Prof. R. R. Schrock, Mass. Inst. of Technology; "A Naturalist in Nyasaland," Arthur Loveridge, Curator of Reptiles, M. C. Z.

President, Miss Ruth D. Turner, Vice-President, Dr. Austin W. Cheever, Conchological Recorder, William J. Clench.

**Clench Conchological Club, Worcester, Mass., Mrs. George H. Schmierer, Secretary:** Our club, although not large in membership, presented the past year what to us was an ambitious program. Besides monthly meetings at which we had as speakers several authorities in the field of mollusks, the club had workshop sessions and spent a day at the William F. Clapp marine laboratories at Duxbury, Mass.

The club is somewhat handicapped because Worcester is an inland city and some 50 miles from the nearest marine collecting grounds. In addition, native molluscan fauna is limited but we manage to maintain a lively interest in the collection and study of mollusks, and during the past year have added several new shell enthusiasts.

Among the speakers were Dr. Howard R. Hill of the Los Angeles Museum who gave us a delightful illustrated talk on West Coast marine life, Dr. Joseph C. Bequaert of Harvard University, William J. Clench, also of

**Harvard's Museum of Comparative Zoology, and R. Tucker Abbott, assistant curator of the Division of Mollusks of the U. S. National Museum.**

Dr. Bequaert gave us a timely talk on the giant African snail at the time they had been discovered at Baltimore in a cargo of scrap iron from Saipan and were much in the news. Mr. Clench, who pays us a visit annually, spoke on Hawaii and its snails before a Sunday afternoon gathering of 100. Mr. Abbott presented an illustrated talk on "Mollusks, Medicine and Man." The audience included several physicians who plied the speaker with questions and, as one doctor remarked, he had all the answers.

Our program for the 1950-51 season includes a number of papers by members on various shell subjects. We also hope to have guest speakers, and we should be happy to have with us shell collectors who happen to be visiting in Massachusetts.

**Conchological Section, Buffalo Society of Natural Sciences, Buffalo, N. Y., Mrs. Margaret C. Teskey, Secretary:** As for the past several seasons, monthly meetings of this organization were held at the home of Mr. and Mrs. Harold R. Robertson, always well attended and highlighted over the months by the following features: a summer picnic incorporating local collecting; an illustrated talk by Mr. Adlai B. Wheel of Syracuse, N. Y. on his methods of teaching nature appreciation in the boy's clubs with which he is affiliated; (Mr. Gordon K. McMillan of the Carnegie Museum, Pittsburgh, was a guest on this occasion.) "Some Minute Mollusks of the Niagara Frontier Region," by Mrs. Harold R. Robertson; "Collecting in Michigan," by Mrs. Margaret Teskey; "Natural Color Slides of U. S. Scenes," by Mrs. Mary Cumming and Mr. James Cumming; Open House in the Robertson shell room, at which time duplicate Florida shells were distributed; sound movies featuring shore life in Nova Scotia, by Miss Jean Russell. The new year was launched by the election of officers, followed by the annual dinner, a truly molluscan meal; sea food served on shells, in shells and with every possible accessory in the molluscan vein. Dr. and Mrs. Fred S. Hoffman returned from Cuba where they had attended the funeral of Dr. Carlos de la Torre, Miss Gertrude Weber returned from Florida, and their homecoming and reports of shelling in the tropics featured the April meeting, at which time a general display of marine bivalves, loaned and arranged by members, was enjoyed by all. "Alcoholic Specimens," by Mrs. Margaret Teare, and a review by Mrs. Harold R. Robertson of Josiah Keep's "The Poetry of Shells," completed the year's activities.

Some new records were set in the field when *Arion hortensis* Ferussac was taken locally, a first record for western New York, and *Arion subfuscus* Draparnaud established a second record for the area.

**Long Beach Shell Club, Ralph Bormann, Secretary:** The Long Beach Shell Club held regular monthly meetings at the Long Beach Public Library with the Christmas party and shell exchange at the home of Capt. and Mrs. Fred E. Barnett, and the Watermelon party and Dutch auction at the home of Mr. and Mrs. Ned Baker, as the highlights of the year.

Two field trips were made to Alamitos Bay, Long Beach, with great success. The first edition of "Shells and Shell Collecting" by the Long Beach Shell Club has been sold out, the Los Angeles County Library placing copies in all of its branches in the County. The club sponsored a shell exhibit in the main Public Library under the direction of Mr. and Mrs. H. Arden Edwards and Mr. and Mrs. Harry R. Turver. The exhibit was viewed by the many people who visit the library, and received favorable comment and interest.

Capt. and Mrs. Fred E. Barnett appeared on a Television show with a very fine display of shells from their collection. Membership cards were made for the first time for our group, and it is hoped that our emblem (*Trophon triangulatus*) will become well known and will help to create an interest in the study of conchology.

The Long Beach Library was asked to furnish an example of their filing system to the National Library Association. The card chosen was on our own book, "Shells and Shell Collecting," and it appeared on a film made by the National Library Association giving the Long Beach Library recognition for their exceptional filing system and incidentally publicity for our group. It has been a successful year with each one helping to create a friendly spirit in the group.

**New York Shell Club, Dr. Walter H. Jacobs, Secretary:** The New York Shell Club is rounding out its second year of life with a membership of 32 enthusiastic students and collectors. We have been meeting once a month in the American Museum of Natural History in Room 129, a central location convenient to members from Rockaway Beach as well as New Rochelle, Nutley, New Jersey as well as Mineola, Long Island. Our meetings are well attended and through a diversity of program prove to be very interesting. We have featured displays of shells (in which Mr. D'Attilio shines with his rare and unique specimens from the very deep waters off Japan); color slides of shells (by Mrs. Freas) or shell localities (Bull Island, South Carolina by Messrs. Karlin and Feinberg); talks on the economic value of molluscs (Tropical Diseases and Molluscs by Dr. Walter Jacobs, the River Naiads and the Button Industry by Mr. Tobleman, Economic Value of Shells by Mr. D'Attilio); and scientific discussions of molluscan families and genera (the Achatinellas by Mr. George Jacobs and the Genus Nerita by Mr. Jacobson.) We plan to make such generic discussions a regular part of each monthly meeting. In addition we have enjoyed a yearly field trip—the last one to the Annsville Cut near Peekskill—which are well attended and not completely unsuccessful. We are completing the third issue of our occasional mimeographed paper *the Notes*, two of which have already been printed and distributed. Our two original projects are (1) the revision of the molluscan faunal list of the New York Area, in which connection we have already added two new records; and (2) a compilation of the history and the activities of earlier shell societies of our city. In this last project Dr. Jacobs and Mrs. Freas have made particularly important contributions. The rapid growth and sustained interest of our Club is testimony to the need for such an organization in New York. The officers, re-elected in February, 1950 are: President, Mr. Morris K. Jacobson; Treasurer, Mr. Anthony D'Attilio; Secretary, Dr. Walter H. Jacobs.

**Pacific Shell Club, Los Angeles County Museum, Los Angeles, Cal., Miss Agnes J. Shumate, Secretary:** Meetings are held on the third Sunday of each month except during the summer at the Los Angeles County Museum. There are ninety-seven active members, chiefly from the Metropolitan Los Angeles area. The club has been instrumental in helping beginners start collections by giving them shells donated by members and others; by illustrated talks given by experts, and by beach trips. Some of the more advanced members have become cowry experts and have over one hundred different species in their collections. Many of the members attended the A.M.U.P. convention in Santa Barbara in April, 1950. Glenn Russell is president, and the treasurer is Lloyd Berry. Dr. Howard R. Hill is sponsor.

## **ACKNOWLEDGMENTS**

Greetings signed by all members present at the Chicago meeting were sent to Dr. Louise M. Perry and the Robertsons who were unable to attend because of the ill-health of Dr. Perry and Mr. Robertson.

Dr. Perry writes: I was so delighted and pleased with the greeting from the members of the Union present at the Chicago meeting. It stirred happy memories of old friends and an absorbing interest that has been out of my life for some years, but by no means out of mind. My own health is not satisfactory and limits activity to some extent but such is the inevitable end—if we live long enough!

Mr. and Mrs. Harold R. Robertson too, wish here to express their appreciation of the greeting which came to them from the meeting and touched them deeply. How closely our common interest binds us in fellowship and brotherhood. Many thanks to you all.

## **THE SEVENTEENTH ANNUAL MEETING**

**BUFFALO, N. Y., AUGUST 22 TO 24, 1951**

The Seventeenth Annual Meeting of the American Malacological Union will be held in the Buffalo Museum of Science, Humboldt Park, Buffalo, N. Y., Wednesday through Friday, August 22 to 24, with hotel headquarters at Hotel Lenox, 140 North St.

A detailed announcement is enclosed with this issue of the Bulletin. The field trip taking in both sides of Niagara River from Buffalo to Queenston and Lewiston will be of unusual interest and pleasure. Non-citizens will be required to have a Border-crossing card in order to enter Canada on this trip. Such a card may be obtained at the nearest immigration office to place of residence. Naturalized citizens must have a naturalization certificate. No identification is required of native-born residents of the States.

Titles of papers accompanied, if possible, with a brief abstract, should be sent early to the secretary, stating time required and if a lantern is desired.

**MRS. HAROLD R. ROBERTSON, Secretary  
136 Buffum St., Buffalo 10, N. Y.**

## ACTIVE MEMBERS

- Abbott, R. Tucker, U. S. National Museum, Washington 25, D. C.  
Abdel-Malek, Emile T., Museum of Zoology, Ann Arbor, Mich. Anat. of f. w. snails.  
Aguayo, Dr. Carlos Guillermo, 4 No. 554 Vedado, Habana, Cuba.  
Ahern, Mrs. Thomas, 8082 Cheyenne Ave., Detroit 28, Mich.  
Aldrich Museum, 12 Bay Island, Balboa, Cal. Conch., and mineralogy exch.  
Alexander, Robert C., 423 Warwick Rd., Wynnewood, Pa.  
Allen, Charles A., 1094 S. King St., Honolulu 53, T. H.  
Ancona, Prof. Ignacio, Instituto de Biologica Casa del Lago de Chapultepec, Mexico D. F.  
Anderson, Lt. Col. A. S., 700 S. Sycamore St., Petersburg, Va.  
Anderson, Miss Eva M., 7220 Lincoln Dr., Philadelphia 19, Pa.  
Andrews, Elizabeth, 605 Pershing Dr., Silver Spring, Md. Col. on outer banks, N. C.  
Andrews, Mrs. James N., Somerset, Va.  
Ashbery, Mrs. Wallace H., 12 E. Depew Ave., Buffalo 14, N. Y.  
Atwater, Rev. David T., 50 Grace Court, Brooklyn, New York 2, N. Y.  
Awald, Clifford J., 162 Southwood Dr., Kenmore, N. Y.  
  
Bailey, Prof. John Wendell, 27 Willway Rd., Richmond 21, Va.  
Baily, Dr. and Mrs. Joshua L., Jr., 4435 Ampudia St., San Diego 3, Cal.  
Baker, Edward Perin, 11619 Downey Ave., Downey, Cal. Pacific coast marine life  
Baker, Dr. and Mrs. Horace B., Zoological Lab., Univ. of Penn., 38th St. and Wood-  
land Ave., Philadelphia, Pa. Res. 11 Chelten Rd., Havertown, Pa.  
Balch, Prof. Francis N., 130 Prince St., Jamaica Plain, Mass.  
Bales, Mrs. Blenn R., 149 West Main St., Circleville, O.  
Barnett, Mrs. Mary Ann, 63, 64 Place, Long Beach 3, Cal.  
Bartlett, Mrs. R. D., 200 Cedar Croft Rd., Baltimore 12, Md. E. coast shells Md. to Fla.  
Bartsch, Dr. Paul, Smithsonian Institution, U. S. National Museum, Washington 25,  
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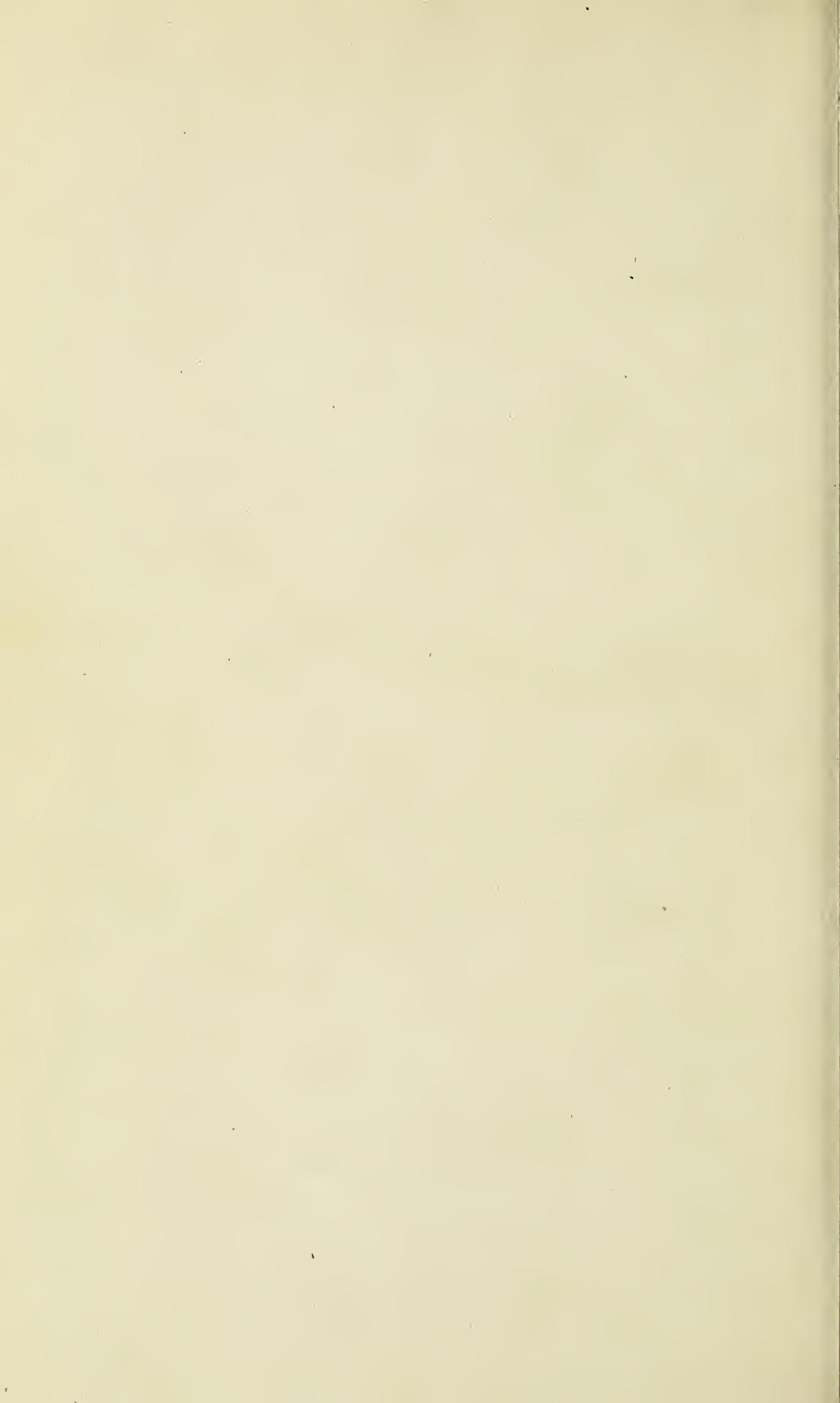
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# THE AMERICAN MALACOLOGICAL UNION



## News Bulletin and Annual Report

Nineteen Hundred and Fifty-one



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Membership List Revised, December 1951

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"There is room in the classroom of Nature for everyone."

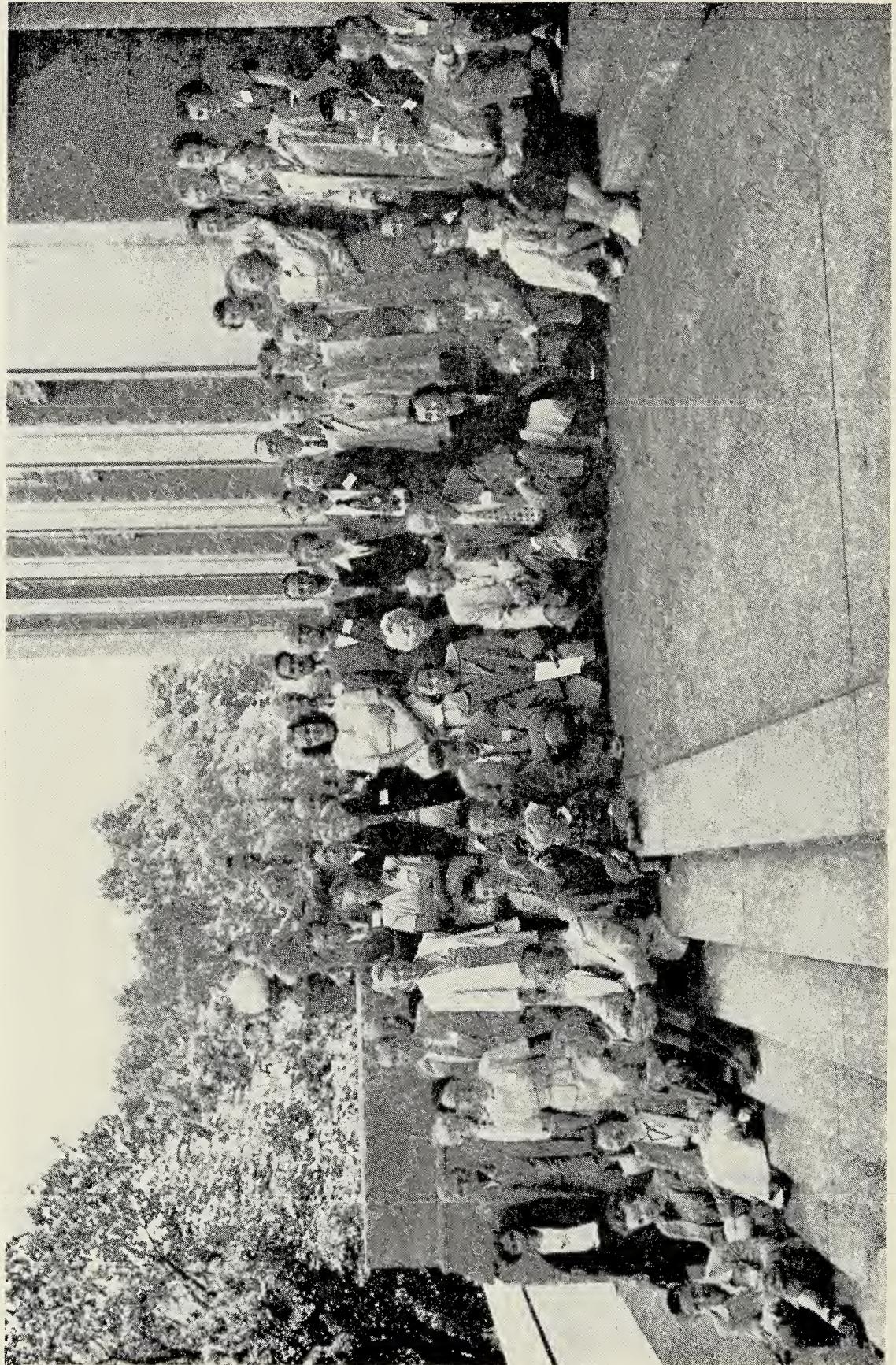
—Dr. Joseph P. E. Morrison

Courtesy of the Buffalo Museum of Science

### DELEGATES TO SEVENTEENTH ANNUAL MEETING OF AMERICAN MALACOLOGICAL UNION

Left to right, back row, seated: Prof. Bruce McCraw, Dr. Henry van der Schalie.

Second row, standing: Dr. Elizabeth Parker Bartsch, Dr. Paul C. Robertson, Dr. J. P. E. Morrison, Ralph Jackson, Mrs. Jackson (hidden), Mrs. Imogene C. Robertson, Thomas Pulley, Mrs. Margaret C. Teskey, Adia Wheel, Mrs. Lillian Morrison, Robert Bloom, Mrs. Eugene Musial, Murray Reed, Mr. Musical, Dr. Fritz Haas, Gordon MacMillan, Mrs. Charles Nelson, Frank Hadley, Mrs. Haas, Mr. Nelson, Mrs. Hadley, Dr. Charlotte Dawley, Louise Becker, Katherine Schiro, Mrs. Ernestine Taylor (hidden), Tannis Lee, Martha Weber, Gertrude Weber, Mrs. Fred Hoffman, Ruth Coats, Mrs. Catherine Bradley. First row, seated: Michael Morrison, Mrs. Morrison, Lilian Morrison, Dr. H. B. Baker, Richard Johnson, Mrs. Baker, Dr. John Oughton and son, R. Tucker Abbott, Ruth Turner, Mrs. Margaret Teare, Dr. Albert Mead, William Cianci, Mrs. Leonard D. A.



**THE AMERICAN MALACOLOGICAL UNION  
SEVENTEENTH ANNUAL MEETING  
BUFFALO, N. Y., AUGUST 22-24, 1951**

The Seventeenth Annual Meeting of the American Malacological Union was held at the Buffalo Museum of Science, Buffalo, N. Y., August 22nd—24th, 1951. When members of the Conchological Section, Buffalo Society of Natural Sciences, greeted early arrivals at the Hotel Lenox the evening before the convention opening, it was with the aplomb of the housewife who entertains company in the parlor knowing that things are well in hand in the kitchen, for the Conchological Section acted as co-host with the Buffalo Society of Natural Sciences, and planning for the function had begun many months earlier. Committees appointed by President Imogene C. Robertson had diligently endeavored to foresee each need and possible emergency, and their efforts were rewarded as the convention rolled smoothly along.

Registration desks were set up in the Hall of Plant Life in the Museum, and registration and reunions occupied Wednesday morning. Visitors viewed the exhibition of shells owned and arranged by Section members (an annual affair) in the adjacent Print Room, then singly and in groups toured the Museum.

As the meeting was opened at 2:00 P.M. in the Museum auditorium, registration was virtually complete and the attendance stood at 74, the second largest gathering in AMU history. President Joseph P. E. Morrison introduced Mr. Fred T. Hall, Director of the Buffalo Museum of Science. Mr. Hall in a short welcoming speech placed the facilities of the Museum and the services of the Museum staff at the convenience of the American Malacological Union. He remarked that he had found pleasure in the approbation voiced as the visitors had toured the Museum, but that he was able to accept little credit, being somewhat of a newcomer himself. (Mr. Hall assumed directorship of the Museum in May, 1951.) The shell collection, he said, had been arranged by a former curator of the Museum, now retired but still on the Associate Staff, Mrs. Imogene Robertson.

In response Dr. Morrison stated that the Union was most appreciative of the hospitality offered, and that the facilities were all that could be desired. He then introduced the first speaker, and the meeting was formally under way.

**TRENDS IN MALACOLOGY**  
**WILLIAM J. CLENCH**  
**(Abstract)**

During the past 100 years there have been some interesting changes in approach to the study of Mollusks. The middle of the 19th century saw a great surge of descriptive zoology and the consequent development of purely descriptive manuals such as Sowerby's Thesaurus and Reeve's *Conchologica Iconica*. Long prior to these English studies was that of the German *Conchylien-Cabinet* which ran through two editions, the first before 1800. Much later in the past century the American Manual of Conchology by Tryon and

Pilsbry came into being, first the series on marine mollusks, then shortly after the series on land mollusks, the latter carried over until 1935.

The field of mollusks has now grown and is still growing to such an extent that manuals attempting to embrace the entire field are quite impossible to produce.

The trend of late years has certainly been limited to studies of far less scope, but developing more intensively the biological knowledge concerned with the species studied.

The approach on a geographical basis also had its beginning during the middle of the past century. These faunistic studies were shaped by such students as J. G. Jeffreys of Great Britain and Moquin-Tandon of France, and, of course several others of their time; these were basic for much of the work that has been done since their initial impetus.

The geographic approach not only persists to the present time but has become far more detailed in its scope for much smaller areas. A classic example of such a study is that exemplified for the area here in Buffalo—The Study of the Mollusca of the Niagara Frontier by Robertson and Blakeslee. This study is not only regional but is also circumscribed by the geological features of an area in western New York and eastern Ontario. Details of local distribution, ecology and other pertinent facts are given which could not be stated in such detail for a study covering a much larger unit area.

Life history studies are demanding more attention. Again, their beginnings are old, at least as old as the classic work of Sellius on the *Teredo* which was published in 1733. Recent work is still directed mainly toward the economic species. The field ahead for investigation of this sort is limitless.

Species concepts have, of course, colored many phases of our studies and have given rise to investigations dealing with complexities of inter-relationships between closely related species groups, species and races. This type of investigation is best exemplified by the work of Gulick, Pilsbry and Cooke on the Achatinellidae and Crampton on the genus *Partula*.

We have here touched upon but a few of the many fields of investigation concerning the mollusca, but these few highlight certain of the paths ahead.

As Mr. Clench concluded, he observed that the fresh water fauna could not be completely reported on in a lifetime.

The second paper was that of Dr. Ralph W. Dexter, L. H. Swart and A. F. Davis, read by Dr. Dexter:

## COMPARISON OF THE MOLLUSKS IN ADJACENT OHIO RIVER AND LAKE ERIE DRAINAGE SYSTEMS

R. W. DEXTER, L. H. SWART, and A. F. DAVIS

Kent State University, Kent, Ohio

(Abstract)

An ecological survey of the mollusks inhabiting adjacent watersheds was made by two graduate students working under the direction of the senior writer. Swart collected between August 1939 and August 1940 from 11 stations in the West Branch of the Mahoning River, some 30 miles long with a 300 ft. gradient and which empties into the Mahoning of the Ohio River

system. Specimens were identified by W. J. Clench and Calvin Goodrich. Additional collections were made by Dexter and Swart in August of 1951. Davis collected from 43 stations in the Cuyahoga River drainage from June to December, 1950. This watershed is over 80 miles long with a gradient of 727 ft. and flows into Lake Erie. Specimens were identified by H. van der Schalie. Pollution is more serious in the Cuyahoga River, especially in the lower half of the stream, but otherwise the habitats of the two are comparable. Seven habitats were investigated—rock, rubble, gravel, sand, mud, submerged and floating vegetation, and emergent vegetation.

In both drainage systems 11 spp. of gastropods, 2 spp. of river clams, and the three genera of finger-nail clams were found as follows: *Physa gyrina*, *P. integra*, *Amnicola integra*, *Goniobasis livescens*, *Ferrissia parallela*, *Helisoma trivolvis*, *H. anceps*, *Gyraulus parvus*, *Valvata tricarinata*, *Campeloma integrum*, *Succinea retusa*; *Anodontoides ferussacianus*, *Anodonata grandis*; *Sphaerium*, *Pisidium*, and *Musculium*. For the most part these were the abundant and widely distributed spp. of the two rivers and their tributaries.

The West Branch of the Mahoning had in addition one common snail, *Lymnaea humilis modicella* on mud banks, and two of local distribution, *Ferrissia diaphana* at one station on rubble and *Gyraulus cristus* at one station on vegetation. Four bivalves, two of them common and widely distributed (*Lampsilis siliquoidea* and *Obovaria subrotunda*), and two less common spp. (*Quadrula undulata* and *Proptera alata*), were also collected only from this stream. The greater degree of pollution in the Cuyahoga River is probably responsible for the dearth of unionids in that stream. It was also noted that the bivalves that were present there were less abundant in comparison with the Mahoning.

In the Cuyahoga River 10 spp. of gastropods and 1 clam were found that were not collected from the West Branch of the Mahoning. However, only three of these were common. *Lymnaea obrussa*, abundant and widely distributed, took the place on mud banks in the Cuyahoga River of *L. h. modicella* found in the West Branch of the Mahoning. *Amnicola limosa* and *Pseudosuccinea columella* were also common in the Cuyahoga but not found in the other drainage. In addition the following six spp. were rarely found, some of them but once: *Gyraulus hirsutum*, *G. deflectus*, *Planorbula armigera*, *Menetus exacous*, *Amnicola lustrica*, and *Campeloma decisum*. *Viviparus malleatus* has been introduced into one short section of the Cuyahoga and a single specimen of the clam *Alasmidonta calceolus* has been collected there.

In general the common and widely distributed spp. were the same in both drainage systems. Pollution has apparently extirpated some mollusks, especially bivalves. Further collecting may possibly prove that most of the spp. inhabit both rivers. Deevey (Bull. Geol. Soc. Amer. 60:1393. 1949) has pointed out that the fauna of the Great Lakes was derived from the Mississippi waterways. There is also some evidence (personal communication of C. N. Savage, Dept. of Geog. and Geol., Kent State Univ.) that possibly an ice lobe had caused a cross-over between the Cuyahoga and West Branch of the Mahoning Rivers before the retreat of the late Wisconsin glacier. Thus the similarity of the molluscan fauna of the now separate drainage systems would be expected.

Dr. Dexter illustrated his remarks with a map of the area under discussion, and with a list of the molluscan fauna from both sources. As he concluded, Dr. Paul Bartsch reminded him that molluscan distribution is not always due to water connections, and that birds are often instrumental in transplanting small mollusks.

# GASTROPODS AND THE ECOLOGY OF LOESS DEPOSITION

DR. A. BYRON LEONARD

(Abstract)

The extensive deposits of late Pleistocene loesses which blanket the underlying sediments in the central Great Plains region are generally accepted as being eolian in origin. However, contrary to the opinions of a number of students of the Pleistocene of this region, Leonard expressed the view that the loesses were not deposited under conditions of widespread aridity, comparable to those prevalent in the days of the "dustbowl." This view is supported by evidence derived from studies of fossil mollusks contained in the loesses. This evidence may be summarized as follows:

1. The molluscan fauna of the Peoria loess numbers about 30 species, approximately three times as many as occur in the region today.
2. Population density, although actually indeterminable, is judged to have been high, since as many as 5000 shells per cubic foot of loess is not uncommon.
3. Many species, such as *Discus cronkhitei*, *D. shimeki*, *Pupilla blandi*, *P. muscorum*, *Columella alticola*, *Cionella lubrica*, *Striatura milium*, *Vallonia gracilicosta*, *Vertigo modesta*, *V. tridentata*, *V. gouldi paradoxa*, and others which were abundant in Peorian times, are now absent from the central Great Plains.
4. From these facts it may be deduced that moisture was more abundant, or more equitably distributed than now, that there was an abundant vegetative cover on the Great Plains, and that therefore the hypothesis that the loesses were derived by wind action from an arid landscape, denuded of its floral cover, is untenable. That the silts which compose the loesses were derived from silts blown from constantly renewed glacial valley trains is proposed as a more acceptable hypothesis.

Dr. Leonard's paper was accompanied with several Kodachrome slides showing the general geologic formation of the locality described. This discussion ensued; Dr. Morrison: "Is loess deposit thicker near streams?" Dr. Leonard, "Yes, and coarser. Extensive studies have been made in this direction." Dr. Fritz Haas: "I am most interested in this, coming from loess country myself. In the aeolian loess of Europe there are but three species of shells, while in the ravines where they were swept together by rain forty to fifty species may be harbored, not homogeneous but stratified. Have you made studies along this line?" Dr. Leonard: "Yes, extensive study. We were helped by an opportune roadside cut made as a highway was being constructed."

# AN OLD PROBLEM IN NAIAD NOMENCLATURE

HENRY VAN DER SCHALIE

(Abstract)

In 1922 a special effort was made by A. E. Ortmann and Bryant Walker to clarify the status of a number of mussel names which could not be generally accepted until the descriptions given to them by Rafinesque in 1920 and 1931 were reevaluated. L. S. Frierson was invited to collaborate but he preferred to act as a champion for Rafinesque and as a consequence Frierson's own version of what names had validity appeared as a private publication five years later (1927). The latter book makes no direct reference to the work of Ortmann and Walker so that at present there are two systems of names which can be used in referring to many species of mussels. The work of Ortmann and Walker was of an unusually scholarly nature and all of the

cases in which they failed to find agreement were submitted to Dr. Pilsbry who acted as a judge, weighed the arguments and ruled on them. Although authors are free to use any system they wish, an appeal is made to encourage a more careful appraisal of the relative merits of these papers in an effort to get more uniformity in the names applied to mussels.

Discussion: Dr. Henry Pilsbry: "I agree that the problems we meet in our present study of fresh water mollusca are more important than the old ones of nomenclature. Unraveling the problems left by Rafinesque intrigues some people; he presents one problem after another!" Dr. van der Schalie: "Rafinesque had the ardor of the explorer without the patience of the investigator. Then too, Modell created a problem which must someday be unscrambled." Dr. Haas: "I am very much interested in Modell since I have been asked to write an article for a treatise on Paleontology and I am following the same system (the Frierson system) he used. He calls his system a natural one, but we know first of all that such a thing as a natural system does not exist." Dr. Morrison: "I'm going to stick my neck out here and suggest that in the three sub-families of the Unionidae, you have a natural classification based on three kinds of sexual dimorphism." Dr. Haas: "Modell could not use those characteristics because he worked mainly with fossils. He used apical sculpture and called it a natural system." Dr. Morrison: "Isn't there a duplication of apical sculpture?" Dr. Haas: "Yes, there is."

## THE PREPUTIAL ORGAN OF SNAILS IN THE GENUS HELISOMA

EMILE T. ABDEL-MALEK

Read by Dr. Henry van der Schalie

(Abstract)

The presence of a preputial organ in the penial complex of the North American genus *Helisoma* was reported by F. C. Baker in 1926. This same investigator (1945) stated that the function of the "penial gland" (preputial organ) is insufficiently known but it seemed to him that one of its functions is that it serves as an excitatory organ or sarcobelum. However, in my studies gross and histological examinations revealed that the preputial organ is not an excitatory organ since there is a papilla at the end of the verge which performs this function. In addition, observations on mating showed that the preputial organ functions as a hold-fast organ, which adheres firmly to the neck of the same snail thus acting as a brace and helping to produce leverage.

Discussion: Dr. H. B. Baker: "The term 'hold-fast' is usually employed to indicate attachment to a foreign object; here it is used to describe self-attachment. I am not sure that it is the correct term." Dr. Dexter: "Could a left-handed snail mate with a right-handed individual?" Dr. Baker: "That is a physiological matter." Dr. Morrison: "Has anyone seen a dextral *Physa*? I should like to examine the anatomy." Mr. Clench: "Henderson had one."

This concluded the program of papers for the opening session, but Dr. van der Schalie spoke briefly on the long-delayed publication of *The Second Index to the Nautilus*. It is going to press at last, said he, and will be ready for distribution about the first of the year. The cash was advanced by the graduate fund of the University of Michigan, it will run to about 450 pages and the cost has been pared to a minimum by the use of off-set printing and elimination of covers. It will cost about \$5. Copies of Part One are still available at \$5, to be ordered through *The Nautilus*.

The meeting adjourned, and delegates returned to the Hotel Lenox to repair the ravages of the day and dress for the annual dinner, held at 7:30 in the hotel dining rooms. As always at these functions food and conversation vied for attention. At the close of the meal Dr. Paul Bartsch made a short speech, praising the long and faithful services of Harold and Imogene Robertson. Until his death in July Mr. Robertson held the office of Treasurer of the A.M.U., and Mrs. Robertson had completed twenty-one years as Secretary. Both were charter members. On behalf of the Union, Mrs. Robertson was presented with three volumes of Taylor's "Monograph of Land and Fresh Water Mollusca of the British Isles." A corsage of gardenias and rosebuds was beside her plate, a gift of the Conchological Section, Buffalo Society of Natural Sciences, which group she serves as president. Although visibly affected by these tributes, Mrs. Robertson was able to express her gratitude, and made a brief speech of acknowledgment. To both herself and to Mr. Robertson, she said, their efforts on behalf of the AMU had been a labor of love, and so was more of a pleasure than a task. As she concluded, a rousing round of applause attested to the devotion of her many friends.

The tables cleared, a screen was set up, and Dr. Albert R. Mead of the University of Arizona entertained with Kodachrome slides and anecdote as he related his experiences "Hunting the Giant African Land Snail *Achatina Fulica* in Micronesia." Since Dr. Mead had entertained a similar group at the earlier meeting of A.M.U.P. and his talk has been covered in the report of that organization, it will not be repeated here. Suffice to say that it was thoroughly enjoyed and that *Achatina fulica* rates as high on the list as an entertainment factor as he does menace to American agriculture.

The Thursday session opened with the report of the council meeting and the presentation of the following slate of nominated officers:

President, Dr. Jeanne S. Schwengel; Vice President, Mrs. Imogene C. Robertson; (Mrs. Robertson resigned her post as Secretary to accept this nomination. The office of Treasurer had been vacant since the death of Mr. Harold R. Robertson in July.) Secretary and Treasurer, Mrs. Margaret C. Teskey. Councilors-at-large, Mr. R. Tucker Abbott, Dr. Carlos G. Aguayo, Dr. Leo G. Hertline and Dr. A. Byron Leonard. It was moved and seconded that the panel be elected without opposition, and affirmation was made by unanimous voice vote.

## WORLD RELATIONS OF THE MELANIANS

J. P. E. MORRISON\*

(An Abstract)

The idea of one family of "Melanians", in the broad sense, is biologically absurd. Instead, there seem to be three families of freshwater snails of this general type, directly related to three separate families of marine snails. The following key to the major groups of the Melanian Complex, based on reproductive characters, is offered as the author's opinion of their true biological relationships.

- A. Reproduction dioecious; MALES present in species.
- B. Female with large grooved "ovipositor" in pit on right side of foot; few eggs of proportionately large size.

\*Published by permission of the Secretary of the Smithsonian Institution. All species herein listed are genotypes of their respective genera.

C. Marine shells	MODULIDAE
CC. Freshwater shells	MELANOPSIDAE
BB. Female with egg-laying sinus and rudimentary papilla, or no special structure on right side of foot; numerous eggs of proportionately smaller size.	
D. Marine shells	CERITHIIDAE
DD. Freshwater shells	PLEUROCERIDAE
E. Males with no intromittent structures.	
F. Females oviparous, with egg-laying sinus in right side of foot	PLEUROCERINAE
FF. Females ovo-viviparous, without egg-laying sinus; brood pouch uterine, the enlarged end of the oviduct	SEMISULCOSPIRINAE
EE. Males with eversible "penis" in mantle edge near end of vas deferens; females ovo-viviparous; brood pouch uterine	TIPHOBIINAE
AA. Reproduction parthenogenetic; NO MALES present in species; brood pouch not uterine, but adventitious (subhaemocoelic) in the neck region, with opening on right side of neck.	
G. Marine shells	PLANAXIDAE
GG. Freshwater shells	THIARIDAE

The Family Melanopsidae of Europe and Western Asia includes the genera *Fagotia* and *Melanopsis*. The true relationship of *Zemelanopsis* from New Zealand is still unknown.

The Pleuroceridae of America all belong to the typical Subfamily Pleurocerinae.

**The North American genera (with their respective genotypes) are:**

**OXYTREMA** Rafinesque 1819 (*acuta* Raf. 1831).

(This genus includes almost all "Pleurocera" and "Goniobasis" species of recent works following Tryon and Walker, and also a number of East Asiatic species.)

Section STREPHOBASIS Lea 1861 (*plena* Anthony 1854).

**GYROTOMA** Shuttleworth 1845 (*excisum* Lea 1842).

**MUDALIA** Haldeman 1840 (*carinata* Bruguiere 1792).

**LEPTOXIS** Rafinesque 1819 (*praerosa* Say 1824).

(Antedates *Anculosa* Say 1821; see: Pilsbry, Nautilus 30:113:1917)

**EURYCAELON** Lea 1864 (*anthonyi* Budd 1854).

**PLEUROCERA** Rafinesque 1818 (*verrucosa* Rafinesque 1820).

Subgenus **ANGITREMA** Haldeman 1841 (*armigera* Say 1821).

**ANAPLOCAMUS** Dall 1895 (*dilatatus* Conrad 1834).

**Io** Lea 1831 (*fluvialis* Say 1825).

**The Central and South American genera are:**

**PACHYCHILUS** Lea 1851 (*laevissima* Sowerby 1824).

Subgenus **OXYMELANIA** Crosse & Fischer 1892 (*schiedeanus* Philippi 1843).

Subgenus **GLYPTOMELANIA** Crosse & Fischer 1892 (*glaphyrus* Morelet 1849).

Subgenus **PILSBRYCHILUS**, new subgenus (*dalli* Pilsbry 1896).

(Characterized by the sinuous lip margin of adult shells).

**DORYSSA** H. & A. Adams 1854. (*atra* Bruguiere 1792).

**Asiatic Pleuroceridae include:**

**Pleurocerinae:**

**OXYTREMA** Rafinesque 1819 (*acuta* Raf. 1831).

(Species from Korea to Szechwan & Fukien Provinces, China; see North American note.)

**PALUDOMUS** Swainson 1840 (*globulosa* Gray 1834).

(Proven by s.s. species from Thailand; the true relationships of the other so called subgenera with different opercula is still unknown.)

**Semisulcospirinae, new Subfamily:**

**SEMISULCOSPIRA** Boettger 1886 (*libertina* Gould 1862).

**African Pleuroceridae:**

**Pleurocerinae:**

**POTADOMA** Swainson 1840 (*freethii* Gray 1831).

**LIMNOTROCHUS** E. A. Smith 1880, **PARAMELANIA** E. A. Smith 1881, and **SPEKIA** Bourguignat 1879, all of Lake Tanganyika, are provisionally placed here because they are reported to be oviparous.

**Semisulcospirinae:** (may also be present in Africa).

**Tiphobiinae:**

**TIPHOBIA** E. A. Smith 1880 (*horei* E. A. Smith 1880).

**BATHANALIA** Moore 1898 (*howesi* Moore 1898).

**LAVIGERIA** Bourguignat 1888 (*grandis* E. A. Smith 1881).

Since every member of the Family Thiaridae is a parthenogenetic female, it only requires one individual (of any age) to start a new population or colony, whenever any of these animals reach a new freshwater locality by stream capture or adventitious transportation.

**American Thiaridae:**

**CUBAEDOMUS** Thiele 1928 (*brevis* Orbigny 1842).

**AYLACOSTOMA** Spix 1827 (*scalare* Wagner 1827).

Subgenus **HEMISINUS** Swainson 1840 (*lineolatum* Gray 1828).

Subgenus **LONGIVERENA** Pilsbry & Olsson 1935 (*tuberculatum* Wagner 1827).

Subgenus **VERENA** H. & A. Adams 1854 (*crenocarina* Moricand 1841).

**TAREBIA** H. & A. Adams 1854.

(An Asiatic genus recently introduced in Florida.)

**Asiatic Thiaridae:**

**THIARA** Röding 1798 (*amarula* Linnaeus 1758).

Subgenus **SETAEARA**, new subgenus (*cancellata* Röding 1798).

(Characterized by cuticular setae continued upward from the "crown" of spines on the shoulder of the whorls).

**TAREBIA** H. & A. Adams 1854 (*semigranosa* Von dem Busch 1842).

**SERMYLA** H. & A. Adams 1854 (*tornatella* Lea 1850).

**STENOMELANIA** Fischer 1885 (*aspirans* Hinds 1844)

**MELANOIDES** Olivier 1804 (*tuberculata* Müller 1776).

**SULCOSPIRA** Troschel 1857 (*sulcospira* Mousson 1848).

**BALANOCOCHLIS** Fischer 1885 (*glans* Von dem Busch 1842).

**TYLOMELANIA** P. & F. Sarasin 1898 (*neritiformis* P. & F. Sarasin 1898).

**ANTIMELANIA** Crosse & Fischer 1892 (*costula* Rafinesque 1833).

**BROTIA** H. & A. Adams 1866 (*pagodula* Gould 1847).

**FIJIDOMA**, new genus (*laddi*, new species).

(An exceedingly low-spined globose shell of a few rounded whorls, with fine spiral sculpture and regular flammules or rows of squarish dots of red in the ground color; aperture semi-circular with a broad flattened white columella; operculum paucispiral like that of *Melanoides*. Holotype 9.2 x 8.2 mm., from the Lami River, Viti Levu, Fiji Islands).

**African Thiaridae:**

**THIARA** Röding 1798.

MELANOIDES Oliver 1804.

(Both these genera are present in the African region as well as the Asiatic.)

TANGANYICIA Crosse 1881 (*rufofllosa* E. A. Smith 1880).

STANLEYA Bourguignat 1885 (*neritinoides* E. A. Smith 1880).

Discussion: Dr. Pilsbry: "This is most interesting; one wonders how and when they got into fresh water. Have you examined Miocene Melanopsidae? There is a resemblance." Dr. Morrison: "No; but geographic routes are not always mapped by fossils." Dr. Leonard: "Then we must call the local snail, *Mudalia livescens?*" Dr. Morrison: "Yes. Members of the genus *Oxytrema* lay a subspiral group of eggs in a single mass. *Mudalia* on the other hand lays its eggs singly, one egg to an egg mass."

LAND SNAILS OF THE NORTH CAROLINA PIEDMONT  
CHARLOTTE DAWLEY  
(Abstract)

The piedmont region of North Carolina between the coastal plain and the Blue Ridge mountains occupies about half of the state. It is a region of rolling hills intersected by small streams and is covered in part by mixed pine and hardwood forests. Very little collecting of mollusks has been done here. This paper reported on the mollusks collected from Davidson County in the spring of 1951 by Mrs. Margaret Teskey and from Guilford County over a period of several years by the author. Twenty-six species were reported, three of which *Polygyra pustuloides* (Bland), *Mesodon appressus* (Say), and *Discus cronkhitei* (Newcomb) have not been reported in North Carolina before.

Dr. Henry Pilsbry: "This report covers a section of the country in which too little work has been done; such contributions are most welcome." Dr. Henry van der Schalie: "Lake Waccamaw in North Carolina has been partially worked over, but some interesting investigation remains to be done there."

SOME PROBLEMS IN THE PHOLADIDAE  
RUTH D. TURNER  
(Abstract)

The various genera and species of the Pholadidae probably have more shell characters upon which the classification of the group can be based than any other family of Pelecypods. The classification is based upon the accessory plates, the shape and extent of the pedal gape and callum, the type of accessory siphonal tube (if present), the presence or absence of the apophysis, and the type and extent of the sculpture. All of these characters are basic and stable, showing little variation within the genus, while the general shape and size of the shell is exceedingly variable depending upon the substratum in which the animal is boring.

The difficult problem in this group is obtaining good preserved specimens in sufficient numbers to show the various growth stages, and accessory plates. Most of the accessory plates are lost in dried material and when using poorly preserved material these plates are often so thin and fragile they are lost or overlooked. Many of the early descriptions were based on old, incomplete, beach worn specimens and consequently could be applied to several species.

The size and shape of the pedal gape changes with age, and the young stages of those groups which later produce a callum can easily be confused

with species in other genera which never fill in the pedal gape. The production of stenomorphs is common when specimens are overcrowded or are boring into an unusually hard substratum. These varying conditions are always reflected in the specimens, those boring into soft easily worked material being long and straight while other specimens of the same species working in hard material may be distorted and only 1/10 normal size. Many such cases have been described as new species, and even genera have been described on the growth stages of a single species.

The siphons appear to have excellent generic and specific characters but to date we have far too little material of a world wide nature to make the best use of these characters.

Fossil accessory plates, particularly the protoplax have been described as gastropods, and on one occasion at least, the apophysis of a *Barnea* was described as a *Capulus*.

When considering the family relationships it is interesting to philosophize on the origin of the apophysis. Though it is possible to find structure in the shells of other families that could have given rise to the apophysis much embryological work will be necessary to solve this problem.

The method of boring of the Pholads has intrigued naturalists for centuries and there are many theories as to how boring is accomplished. It is generally believed today, however, that the process is entirely mechanical and that they can bore only into rocks which are softer or ones in which the cementing factor is softer than the shell.

This paper was accompanied with Kodachrome slides of unusual interest and clarity. The final slide pictured Mr. Richard I. Johnson completely absorbed in his task of extracting a rock-embedded mollusk; this candid study inspired Dr. Morrison to remark that he trusted the pictured collecting trip was not altogether boring! Dr. Bartsch: "Miss Turner is to be congratulated on her work and presentation. She is fortunate in being able to work with live and varied material." Dr. van der Schalie: "Is there not a relationship between structure and function? These mollusks are an engineering marvel; some day this angle must be more thoroughly studied." Miss Turner: "I agree. However, we are at the present time engrossed in taxonomy." Dr. Ralph W. Dexter: "Do these mollusks who bore in wood digest the wood?" Miss Turner: "That is more or less controversial; they do consume the wood as perhaps a disposal method. Certainly they do not feed on it."

## GENETIC ANALYSIS OF WILD POPULATIONS OF THE LAND SNAIL, CERION

Colonial Inheritance of the Multiple Factor for Shell Length

R. TUCKER ABBOTT

(Abstract)

A preliminary biometric study was made of over 500 colonial samples of the land snail, *Cerion*, housed in the Museum of Comparative Zoölogy, Harvard College. 50 colonies were measured in detail. Of these, 20 were used in histogram form and shown on lantern slides. From the material presented, there appears to be a multiple factor for shell length which appears at random in colonies and sets a mean for the size of individuals of a colony. The variation in size of the mean length of a colony is inherited without change unless hybridization with another colony takes place or unless there is a genetic drift within the colony.

In hybridization between two colonies the mean may be unchanged because of the dominance of the multiple factors of one or the other of the orig-

inal colonies; or an intermediate mean may be expressed in some cases.

Possible "genetic drift" in which the mean length of a colony changes over a period of several or many generations occurs exclusive of hybridization, and is probably brought about by intra-colonial segregation during migration or by partial elimination of individuals by adverse ecological conditions.

Mr. Abbott's paper was illustrated with numerous charts. Discussion: Dr. Morrison: "Was this drift in size by units?" Abbott: "Yes, by genetic colonies." Dr. Bartsch: "This ties in with the intensive studies I have made of the Cerionidae. I discovered that my experimental plantings took three years to mature. Where colonies were isolated, environment such as grass, coral, etc., brought about no material change. But in one batch, *Cerion incanum* had mixed in, bringing about extreme and sometimes grotesque hybridization. I was able to make intensive anatomical studies. And again the birds played their part when the sparrow hawks at Dry Tortugas mixed up my plantings!"

A break for lunch at this time was followed by a muster on the Museum steps while a group photograph was made. The ceremony was brief, for a high wind and chilly temperature made even the hardy Buffalonians shiver.

### TRITON'S PIPE ORGAN

GERTRUDE VILLFORTH MUSIAL AND EUGENE MUSIAL

(Abstract)

When the Reverend Henry Zahn, teacher in a missionary school in New Guinea, felt the need of music in instructing his native pupils, he decided to organize an orchestra. But there was no money for instruments. What more natural, then, than that sea shells be utilized to serve the purpose of conventional instruments? Natural perhaps, but most difficult. After much experimentation, he adapted a set of shells, each tuned by piercing the body whorl then stopping the cavity with putty to effect the desired note when blown trumpet-fashion. One note to a shell, one shell to a boy. And the player signaled to sound his instrument at the proper time by a rap on the head from a stick wielded by the instructor! A primitive band playing primitive music, but music sublime in natural simplicity. When the Reverend Zahn returned to Germany at the termination of his duty in the South Seas, he carried home a set of orchestral shells, the gift of his pupils. It was from these shells that the pictures and recordings presented at this time were made.

This paper was followed by a brief motion picture which portrayed the members of this unique orchestra and their primitive instruments. And finally, a sound recording of two hymns was played, reproduced from the original tape recordings made at the mission school. The deep resonant notes were indeed comparable to those of the finest of pipe organs. Mrs. Musial had been supplied with the material for her paper by her father who occupies the position of school superintendent at Mittereicherstrasse, Bavaria, Germany, and by officials at the mission school at Neuendettelsau.

### MALACOLOGICAL LEGISLATION

(Abstract)

ALBERT R. MEAD

As a result of the articles in the August, 1949, ATLANTIC MONTHLY and the October, 1949, READER'S DIGEST, pointing out the lack of federal quarantines against noxious snails and especially the giant African snail (*Achatina fulica*), the people of Texas called on Representative Wingate Lucas to start needed action. On September 27, 1949, Representative Lucas introduced into Congress H.R. 6242 which unfortunately called for regulations

excluding only the single species *Achatina fulica*. It was finally passed by the House ten months later—on July 27, 1950. A rider, concerning the transference of peanut acreages, was placed on H.R. 6242 by Senator Burnet Maybank and in this amended form it was passed by the Senate and returned to the House in December 1950. The House failed to agree on the amendment and the bill died with the close of the 81st Congress.

Early in the 82nd Congress, the assistance of Majority Leader Ernest W. McFarland was sought. On May 15, 1951, he introduced S. 1489 which was worded similarly to H.R. 6242 except that it included all freshwater and terrestrial mollusks. To speed action on this legislation, Representative Lucas introduced a companion bill, H.R. 4443, on June 13, 1951. If these bills, now before Congress, are amended it is feared that they will suffer the fate of H.R. 6242. Every assistance is needed to expedite their passage.

The bills, if passed, would empower the Secretary of Agriculture to set up regulations prohibiting the entry of all terrestrial and freshwater mollusks. The wording of the bills, however, permits great latitude in interpretation and thus elements of danger are definitely present. Mollusks destined for scientific investigation, not excepted in the wording of these bills, should presumably be permitted entrance under certain conditions. The word "live" is not present in the bill and hence shells and shell products would unfortunately seem to be embraced in the exclusion. The word in question brings in still more difficulty when it is realized that many a conchologist has put away a live snail believing it was dead. How then can we expect quarantine inspectors to tell the difference? Some have suggested the use of methyl bromide and hydrocyanic acid gases or heat in the treatment of shipments of shell specimens to insure that they are all dead. Several objections to this treatment are immediately apparent. Some officials charged with the formulation of the regulations have indicated that exclusions should concern a definite list of harmful and potentially harmful mollusks rather than all mollusk species. But how can we be certain that such a list will prove adequate? These and other matters are already demanding the attention of our officials.

If the bills are passed in their present form, there will still be need for the help of many to insure that the regulations promulgated will prove adequate and yet not unnecessarily restricting.

Discussion: R. Tucker Abbott: "Dr. Bartsch has had ample experience along this line in connection with his work with the U. S. Public Health Quarantine Service. And another angle is that potentially dangerous mollusks may bypass the customs inspectors by coming in by mail. Postal inspectors are apt to take a dim view of what they consider meddling by outside inspectors." Dr. Mead: "You may recall that I referred to just this problem in my Atlantic Monthly paper. Between May 1947 and April 1948, 721 cases and 24,969 baskets of living edible snails were imported into New York City alone from Europe and North Africa. These figures indicate that this is no small problem." Dr. Haas: "How would proposed legislation cover snail eggs?" This brought about general discussion as to the definition of "living snails," the longevity of snails in a dormant condition, etc. A brief account of the difficulty of obtaining a permit for the field trip collectors to bring their specimens into the United States from Canada concluded the discussion on this paper.

(Three days after the close of the convention, August 27, 1951, Congress passed and sent to the White House the two identical bills; President Truman signed one (H.R.4443) and it became Public Law 152 of the 82nd Congress on September 22, 1951.)

## COLLECTING IN CAPE BRETON

GORDON K. MACMILLAN

(Abstract)

It had been my ambition for quite a number of years to conduct a collecting trip to Cape Breton, the northernmost section of the Province of Nova Scotia, Canada. The purpose of this expedition was to study the effects of isolation upon the speciation of the land and freshwater snails, and also to tie up the results of this study with those obtained by Dr. S. T. Brooks, former Curator of Invertebrates at the Carnegie Museum, with a similar project in Newfoundland. Cape Breton Island had been separated from the mainland by the flooding of the St. Lawrence Valley some 25,000 years ago. The Strait of Canso, parting Cape Breton from the remainder of Nova Scotia, is one-quarter to one mile in width, thus creating a formidable barrier to the migration and distribution of animal life.

Last summer this aspiration of mine was fulfilled when I was able to spend the month of August in Cape Breton collecting land and freshwater mollusca and other natural history objects in and around Sydney, Baddeck, Baddeck Bay, and Whycocomagh. However, before reaching my destination I stopped at the Royal Ontario Museum, Toronto, the Canadian National Museum, Ottawa, the Peter Redpath Museum, Montreal, and the Provincial Museum of Quebec, Quebec City. Locality lists of the land and freshwater snails from the collections of these institutions were made not only from Cape Breton, but also from Prince Edward Island, Magdalen and Anticosti Islands.

This informal talk was illustrated with numerous Kodachrome transparencies showing the Museums visited in eastern Canada and the varied ecological situations from which the natural history specimens had been obtained.

## THE STORY OF TYRIAN PURPLE

R. TUCKER ABBOTT

(Abstract)

A brief account was given of the history, manufacture and uses of the molluscan purple dye obtained from snails of the Muricidae family. In the Mediterranean area, Tyrian purple was in use by the Egyptians and Cretians before 1600 B.C. The Phoenician cities of Tyre and Sidon owed the success of their far-flung trading empire to the monopolistic manufacture of this dye. Methods of manufacture were described by Aristotle and Pliny, and the details of preparation were given in this paper. Purple dye was used extensively in northwestern Europe where it was obtained from the dogwinkle, *Thais lapillus*. The Indians of the Pacific tribes of Central America used the Wide-mouthed Purpura, *Purpura patula pansa* Gould, but they "milked" the snails of their dye instead of destroying the entire shell and animal. Two colored slides were shown that depicted the various species of *Murex* and actual samples of the various shades of Tyrian purple. A complete account with colored illustrations will appear in a forthcoming book entitled, "American Seashells."

## PORTRAITS OF SOME FLORIDA OPISTHOBRANCHS

HENRY PILSBRY

An interesting series of Kodachrome slides was shown and commented on by Dr. Pilsbry. Especially featured was *Tethys willcoxi*, which was pictured from various angles. The showing was concluded with a candid portrait of Dr. Pilsbry himself, which brought a rousing ovation from his audience.

## GLIMPSES OF THE PAST PAUL BARTSCH

Dr. Bartsch might well have substituted for his title, "The Making of a Malacologist," for his brief remarks traced his own life from the day when at a tender age he buried snails in a tin can, to later exhume not only living snails but their pearly eggs. He studied under Dr. Henry Pilsbry in Iowa and later under Dr. Wm. Healy Dall. Working for the Bureau of Fisheries, he went on a voyage of the Albatross, taking all organisms *except* fishes. ("Bartsch was omnivorous then!") In 1911 he went again to the Gulf of Lower California, and remembers so vividly the elephant seals on the Galapagos Islands. Other precious memories concern his association with John B. Henderson, George E. Clapp and Charles Simpson. Now retired after fifty years in the service of the Smithsonian Institution, Dr. Bartsch closed his remarks with the reminder that this greatest of all museums is the property of every United States citizen. It is the duty, then, of every citizen to aid in its support, and his privilege to enjoy it.

## THE CARVING OF NIAGARA GORGE JOHN D. SARGENT

This paper was especially timely, since Mr. Sargent described an area which was to be visited by the majority of his audience on the following day. Niagara Falls, said he, was at one time twice as high as it is now. It was also far down the river from its present site. It has taken several thousand years for the river to cut back from Niagara Glen to the place the tourist visits today. Mr. Sargent employed maps and aerial photographs to trace the evolution of this most famous of Niagara Frontier landmarks.

This closed the academic portion of the meeting, and a final exodus from the Museum ensued. However, an hour later the delegates convened once again, this time in the hotel dining rooms to enjoy the hospitality of General Frank R. Schwengel and Dr. Jeanne S. Schwengel. A social hour was followed by a sumptuous supper, and good fellowship was the order of the evening.

The field trip on Friday had somewhat of an international aspect, for the major part of the day was spent in Canada. A chartered bus transported forty-one passengers to Niagara Glen, Ontario, stopping briefly to view the panorama of Niagara Falls, and again at the Whirlpool in the lower river.

Niagara Glen is the site of a prehistoric falls, a sylvan ravine with huge jumbled rocks, steep trails and a fascinating flora and fauna which has delighted geologists, botanists and ornithologists for generations. Nor were the conchologists disappointed on this occasion, for although the molluscan fauna is limited to the more common regional species, the combination of mist and abundant limestone causes the terrestrial snails to develop to their maximum in size and coloration.

In the river at the bottom of the glen is Cripp's Eddy, an interesting small cove which features a tricky tide. A few of the uninitiated were drenched before they learned to time their collecting activities to coincide with the two minute schedule of the eddy.

Return to the States was made via the famed Rainbow Bridge at Niagara Falls, and a brief stop was made to allow collecting from the rocks and in the river at the foot of the American falls. It was a weary but happy group who disembarked at the hotel at the end of the day. Farewells and pledges to meet next year ensued, and so ended the 1951 annual meeting of the American Malacological Union.

MARGARET C. TESKEY, Secretary

## **MEMBERS AND GUESTS IN ATTENDANCE**

R. Tucker Abbott, Washington, D. C.  
Mrs. Wallace H. Ashbery, Buffalo, N. Y.  
Mrs. Roy C. Athearn, Fall River, Mass.  
Mr. and Mrs. Clifford J. Awald, Kenmore, N. Y.  
Dr. and Mrs. Horace B. Baker, Philadelphia, Pa.  
Dr. Paul Bartsch and Dr. Elizabeth Parker Bartsch, Washington, D. C.  
Miss Louise W. Becker, Buffalo, N. Y.  
Robert J. Bloom, Syracuse, N. Y.  
Mr. and Mrs. A. Y. Bradley, Eden, N. Y.  
William J. Clench, Cambridge, Mass.  
Miss Ruth E. Coats, Tillamook, Oregon  
Mrs. Lillias F. Cockerill, Sanibel, Florida  
Mr. and Mrs. Z. W. Craine, Norwich, N. Y.  
Mrs. James A. Cumming, Grand Island, N. Y.  
Dr. Charlotte Dawley, Greensboro, N. C.  
Dr. Ralph W. Dexter, Kent, Ohio  
Miss Norma Fritton, Buffalo, N. Y.  
Mrs. Lester B. Gary, Buffalo, N. Y.  
Miss Martha Gary, Buffalo, N. Y.  
Dr. and Mrs. Fritz Haas, Chicago, Ill.  
Mr. and Mrs. Frank K. Hadley, West Newton, Mass.  
Mr. and Mrs. Fred T. Hall, Buffalo, N. Y.  
Mrs. Fred S. Hoffman, Buffalo, N. Y.  
Miss Marietta Horton, Eden, N. Y.  
Mr. and Mrs. E. O. Houghton, Toronto, Ontario, Canada  
Mr. and Mrs. Ralph W. Jackson, Cambridge, Maryland  
Richard I. Johnson, Belmont, Mass.  
Mrs. Tannis Lee, Toronto, Ontario, Canada  
Dr. and Mrs. A. Byron Leonard, Lawrence, Kansas  
Bruce M. McCraw, Guelph, Ontario, Canada  
Dr. Albert R. Mead, Tucson, Arizona  
Dr. and Mrs. Joseph P. E. Morrison, Washington, D. C.  
Miss Lilian Morrison, Washington, D. C.  
Michael Morrison, Washington, D. C.  
Mr. and Mrs. Eugene Musial, Buffalo, N. Y.  
Mr. and Mrs. Charles D. Nelson, Grand Rapids, Mich.  
Dr. and Mrs. John Oughton, Guelph, Ontario, Canada  
Dr. Henry A. Pilsbry, Philadelphia, Pa.  
Thomas C. Pulley, Houston, Texas  
Murray E. Reed, Syracuse, N. Y.  
Mrs. Harold R. Robertson, Buffalo, N. Y.  
Mrs. Howard J. Roeller, Eden, N. Y.  
Richard Roeller, Eden, N. Y.  
Miss Katherine Schiro, Tampa, Florida  
Eugene H. Schmeck, Niagara Falls, N. Y.  
Dr. Jeanne S. Schwengel, Scarsdale, N. Y.  
Mr. and Mrs. Fred I. Sigman, Elma, N. Y.  
Miss Ruth Sparrow, Buffalo, N. Y.  
Mrs. Ernestine Taylor, Tampa, Florida  
Mrs. Margaret M. Teare, Buffalo, N. Y.  
Mr. and Mrs. P. H. Teskey, Buffalo, N. Y.  
Miss Ruth D. Turner, Cambridge, Mass.  
Dr. Henry van der Schalie, Ann Arbor, Mich.  
Miss Gertrude M. Weber, Buffalo, N. Y.  
Miss Martha Weber, Buffalo, N. Y.  
Adlai B. Wheel, Syracuse, N. Y.

## HAROLD RALPH ROBERTSON

1877 — 1951

ANNIE C. HOFFMAN AND FRED S. HOFFMAN  
“To him who in the love of Nature holds  
Communion with her visible form, she speaks  
A various language.”

Harold Ralph Robertson, Treasurer of The American Malacological Union, passed away on July 15, 1951, after a long period of invalidism following an operation in 1944. For the past two years he had been confined to bed although able to continue an active interest in the work of the Union until a few weeks before his death.

He was born in Liverpool, England, and came to this country with his parents as a boy of eleven, continuing his education at private schools here. In 1903 he married Imogene C. Strickler and joined the recently formed Conchological Section of the Buffalo Society of Natural Sciences of which she was a member. We became acquainted with him then, and now we think back over nearly fifty years of friendship, recalling Harold's keen appreciation of the true values of life which was shared by his wife, “Genie.” Theirs was an unusual oneness of interest, both being devout Christians, both interested in the natural sciences including geology, conchology, microscopy and botany.

When John E. Andrews, then president of our Conchological Section, returned from a winter in Florida in the spring of 1931, he was much enthused with the work which Norman W. Lermond, whom he had met there, was doing in preparation for the organizing of what was to become The American Malacological Union. The meeting of the Conchological Section at which he presented these plans was held at our house, and several of the members who had not already joined the movement, added their names. Mrs. Robertson, at this time, was working on the shell collection in the new Buffalo Museum of Science, and when the organization meeting was called to be held in the Academy of Natural Sciences in Philadelphia, she was sent by the Museum, Harold and Mr. Andrews accompanying her. In the selection of officers she was made recording secretary and later was asked to assume the duties of treasurer as well with the designation of Financial Secretary. As the membership of the Union increased the two offices were again separated and Harold became Treasurer, the two working together as always, in encouraging the growth and solidity of the organization which had become so dear to their hearts.

As a part of Mrs. Robertson's work at the Museum she had been commissioned to prepare a guide to the study of local mollusca, and in preparation for this work she enlisted the cooperation of the Conchological Section in checking localities listed by Dr. Elizabeth J. Letson. Harold entered with zest into this project, and, accompanied by Mr. Andrews, made many collecting trips by auto, visiting most of the recorded sites in the summer of 1931. It was on one of these trips that he discovered *Vivipara contectoides* in Lake Erie at the foot of Michigan Avenue, a new record for the Niagara Frontier, although it occurs here now in abundance. Another record was that of *Radix auricularia* in Cazenovia Creek at East Aurora, the discovery of which he shared with Lester B. Gary. This lymnaeid has since disappeared.

Harold's versatility, resourcefulness, and adaptability were evidenced at the A. M. U. meeting in Toronto, Ontario, in 1939. Sessions were held in the Royal Ontario Museum of Zoology, and the banquet was in the Great Hall,

Hart House. Our last meeting having been held in Havana, Cuba, several members from there, including Dr. Carlos de la Torre, were present. The visit of King George VI and Queen Elizabeth of Great Britain was an event which had occurred only a fortnight previous when they had been entertained at luncheon in this very room. Asked by President Maxwell Smith just thirty minutes before to act as Toastmaster, he rose superbly to the occasion. His remarks had an international flavor as he proposed toasts to the monarchs of Great Britain, to President Batista and his wife of Cuba, and to our own President, Franklin Delano Roosevelt and Mrs. Roosevelt, in well-chosen words eminently gratifying to all.

Harold's genial manner and quick repartee made him a charming companion, and many will remember his kindly efforts at past meetings in making the shy ones feel at ease and helping them to become acquainted. He loved young people, and his long invalidism was brightened at times by the visits of neighborhood boys who came in to play chess or checkers with him. He was a good player and they felt that they learned much from him, not only in playing but in ethics.

The latch-string is always out at the Robertson home as it previously was at the Strickler's; so when his illness confined him at home, the Conchological Section members gladly met at 136 Buffum Street as it assured the presence of our president (Genie) and also gave Harold an opportunity to hear the program, enter into the discussion, and offer pertinent suggestions as well as to see the members.

Besides his wife, he is survived by two daughters, Mrs. Walter McCausland and Mrs. J. Gordon Petrie, two sons, Clarence Paul and Ralph Alden Robertson, all of Buffalo, two sisters, Grace and H. Winifred Robertson, and four brothers, Robert Reed, Ernest, Walter, and James Arthur Robertson, all of Philadelphia.

As a staunch friend and participant in all our activities Harold will be missed greatly. After these many years of friendship we like to think of him as one who, "sustained and soothed by an unfaltering trust . . . wraps the drapery of his couch about him and lies down to pleasant dreams."

## NOTES and NEWS

"Captain" Adlai B. Wheel who is known to so many of us is equally well known in his home town of Syracuse, N. Y. for the excellent work he has done with the boys of that city. Affiliated with the Syracuse Boy's Club and the Syracuse Y.M.C.A., he is establishing a children's study museum of natural history objects. At the present time interest is centered in the continent of Africa, and the Captain will welcome aid in materials and contacts. Duplicate shells, natural history objects, addresses, etc., will be more than appreciated.

Although ill health has confined Dr. Louise M. Perry to her home in Asheville, N. C., she writes expressing her pleasure in receiving the signed greeting from her friends attending the recent convention. Dr. Perry is a Past President of the A.M.U.

It was with the greatest concern that the colleagues of Dr. Albert R. Mead learned that as he was attending the A.M.U. convention in Buffalo, his young daughter was stricken with polio at her home in Arizona and died before her father could reach her side. From one coast to the other the many friends of Dr. and Mrs. Mead extend their sympathy.

**AMERICAN MALACOLOGICAL UNION — PACIFIC DIVISION**  
**MINUTES OF THE FOURTH ANNUAL MEETING**  
**Mills College, California**  
**JUNE 22-24, 1951**

The meeting was called to order Friday afternoon, June 22, at 2:20 by the Chairman, Dr. Leo G. Hertlein, with a total of 45 members and guests registered. Dr. Hertlein introduced President Lynn T. White of Mills College, who gave a short welcoming talk, followed by brief words of greeting by the Chairman of the Division. After few preliminary announcements on duration and times of sessions, meal hours, etc., the meeting was opened for papers.

Mr. Allyn G. Smith spoke first on the subject: "Professor Josiah Keep of Mills College—Teacher and Conchologist". He remarked that it was eminently appropriate that we dedicate this Fourth Annual Meeting of the Pacific Division to the memory of Professor Keep who had been so well-known and revered among the older West Coast conchologists, and who had spent about a quarter of a century as a Professor of Natural History at Mills College. He traced the brief history of Professor Keep's life, calling particular attention to his publications on West Coast Shells and his Chataqua lectures on conchology during the summer at Pacific Grove for many years until his death there in 1911. Mr. Smith spoke of his recollections of one of these summer lecture series which he attended and where his interest in shells began under the kindly direction and friendship of Professor Keep. (Later in the session, Professor Keep's daughter, Miss Rosalind A. Keep came into the meeting and was introduced by Mr. Smith.)

The next speaker was Dr. Hertlein, who initiated a symposium on: "Collectors and Collections in Northern California". He mentioned the formation of the California Academy of Sciences in 1854 and gave brief reviews of the scientists, particularly the conchologists, who contributed to the building up of the shell collection. Mentioned in this connection were J. B. Trask and the first geological survey of California; J. D. Whitney and the second California Geological Survey; W. M. Gabb, paleontologist and part-time curator of the Academy in 1863; J. G. Cooper and his zoological and ornithological survey of California in 1861; William H. Dall, chief of the Scientific Corps of the Western Union Telegraph Survey in 1865-66; W. G. W. Harford, Academy curator in 1867; Josiah Keep, curator of conchology in 1881; F. M. Anderson, curator of invertebrate paleontology in 1902; E. L. Packard who studied and published on the marine shells of the U.S.B.F. "Albatross" survey of San Francisco Bay in 1910; Williard M. Wood, a San Francisco collector; and William Sutton, also a San Francisco collector. Dr. Hertlein mentioned the private collections of Michael Ross, a San Francisco printer, and of Alfred Planert, a wood-carver. He called attention to three non-scientific collections —those at the former famous Woodward's Gardens in San Francisco, at the De Young Museum in Golden Gate Park, and at the Sutro Baths (recently sold by Mr. Sutro). Dealers mentioned were Herrmann & Co. (formerly Hettrich & Herrmann) and now out of business, and the Pacific Curio Shop at Fisherman's Wharf operated by Mr. John Saxby, a present AMU member.

As the speaker mentioned various scientists, the portraits of several were shown on the screen, including Professor Keep, Eschscholtz, T. A. Conrad, Trask, Gabb, Cooper, Dall, Harford, Hemphill, and Raymond.

Continuing the symposium, Dr. A. Myra Keen reviewed the history of the Stanford Collection starting with the purchase of the Law Collection by Dr. J. P. Smith in 1892-95, which was later catalogued by Mr. A. M. Strong. In 1908-10 the Ralph Arnold Collection mostly of fossils was acquired by donation. Arnold subsidized Harold Hannibal to collect for him and in addition Hannibal collected much fresh-water material, which is on permanent loan to Stanford. At Stanford also is the large series of duplicates from the Henry Hemphill Collection (the main collection having been acquired by the California Academy). Cataloguing of this material by Mrs. Ida S. Oldroyd subsequently resulted in the deposit of the large marine collection of the Oldroyds at Stanford. Dr. Keen spoke of later additions to the collection by alumni including Eric Jordon, Tolliver, and others and of donations from the U. S. National Museum, and purchases of small collections through the operation of an alumni fund. Specific reference was made to the acquisition of the Mitchell Collection of Philippine shells (2000 species—almost 2 tons of material) and of recent donations from Professor W. G. Schenck (at present with SCAP in Japan) of shells from New Guinea, the Philippines, and Japan. Of private collectors in the region south of San Francisco Bay the names of Mrs. Kennedy, Mrs. Gimble, Mrs. Fackenthal of Pacific Grove, and of Andrew Sorensen were cited.

Concluding the symposium, Mr. Allyn Smith spoke of the work of Dr. J. G. Cooper and of his contribution to the shell collection at the University of California; of the Rowell Collection, later acquired by the University; of the so-called D. O. Mills Collection at the University; and of the existence of a number of Cooper's types in this collection. He said the large collection made by the late Fred Button, especially rich in *Cypraea*, still remained gathering dust in Oakland. Mention also was made of the W. J. Raymond Collection, recently acquired by Miss Ruth Coats of Tillamook, Oregon; of the fine collection of Olives made by Mr. and Mrs. E. W. Gifford of Berkeley, and of the collections of Ralph Fox, Mary Nimitz, and his own that is now close to 10,000 acquisition numbers.

In the discussion following these talks, Dr. Hertlein mentioned the Lorenzo G. Yates Collection stored in the City Hall Basement at Santa Barbara. Mr. Hinshaw spoke of the J. K. Oliver Collection at Monterey, and of the collection at the Pacific Grove Museum containing 6-7 cases comprising the M. J. Becker Collection, 3 drawers of the Alvin Seale Collection, some of the Button Collection duplicates and the F. W. Woodworth Collection.

Following a brief recess, Dr. Howard Hill of the Los Angeles Museum read an interesting paper on "The Parasites of Mollusks". Dr. Hill catalogued the various types of parasitic flukes in the life histories of which mollusks are known to play a part, and he discussed the role of mollusks, reptiles, birds, and mammals as primary or secondary or final hosts. Work of the U. S. Bureau of Public Health was mentioned, especially in its studies of the possibilities that local U. S. species of fresh-water mollusks might be suitable hosts of *Schistosoma* from Asia. During a discussion of Dr. Hill's paper he stated that results of studies on the possible development of schistosomiasis in the U. S. were not yet definite. Dr. W. O. Gregg, however, pointed out that the fresh-water genus *Tropicorbis* found in Louisiana had been infected with *Shistosoma* experimentally, thus indicating a present danger of infection.

The final period was devoted to notes and comments by those present, which produced the following items:

Dr. Hill spoke of the confiscation of 120 cases of live *Helix aperta* at San Pedro recently, which had been shipped from French Tunisia. Dr. Hertlein commented on the burrowing proclivities of this snail, of its existence already in San Diego County, and of the difficulties the Pest Control Division of the California Division of Agriculture was having in its attempts to eradicate the snail from infected areas.

Mr. Weber spoke interestingly of collecting *Polymita* in Cuba, of its increasing scarcity because of its use in the novelty trade, and of steps taken in Cuba to prevent taking *Polymita* except for scientific purposes. Mr. Weber pointed out how hard it is to prevent wholesale collecting of this beautiful snail as poor people still gather and sell them illegally for 50c a bucket. Another and perhaps more serious threat to *Polymita* is the rapid cutting down of the forest trees for charcoal-burning. Already the forests of Oriente Province are nearly all gone as a result of this. Mr. Weber said that a large part of Baracoa was inhabited by *Polymita* at one time, as represented by layers of shells six inches thick in the ground, but they are hard to find there now. The chances for the ultimate survival of *Polymita* is extremely slim, according to Mr. Weber.

Mr. Smith mentioned the spread of European slug *Arion ater* in the Seattle region and its most recent collection as far from Seattle as Snoqualmie Falls. It is prevalent in gardens in some sections of Seattle, he said, and is apparently common on Mercer Island in Lake Washington. Mr. Chace commented that he had collected this slug in Seattle in 1937. It has also been reported from Portland, Oregon. Dr. Mead commented on the difficulty of distinguishing *A. ater* from the black form of *Ariolimax columbianus*, native to the region and Mr. Smith said there were several color forms in addition to the black one, mainly brown and occasionally terra-cotta color.

Highlight of the Friday session was the evening talk on "Hunting the Giant African Snail in Micronesia" given by Dr. Albert R. Mead, Associate Professor of Zoology, University of Arizona. Dr. Mead's discussion took the form of a 23,000 mile travelogue through the remote islands of the Micronesian group, including the Marianas, Marshals, Carolines, and Bonins—a trip taken under the auspices of the U. S. Bureau of Naval Research and the Pacific Science Board of the National Research Council. Dr. Mead's mission was to make a survey of all aspects of the Giant African Snail (*Achatina fulica*), to select an island for experiments in biological control of this world's largest snail pest, and to make recommendations for a long range control program. He was accompanied by Yoshio Kondo of the Bishop Museum, and he spoke interestingly and with frequent flashes of humor of their experiences of living with the natives on these faraway islands. The speaker illustrated his talk with a large series of excellent colored slides, which showed how prolific and how destructive the Giant African Snail really is. Dr. Mead pointed out the extreme danger of allowing this pest to become established in the United States. Existence of this snail in one of the northern Bonin Islands, with a climate not unlike that of some of the southern United States, makes this country vulnerable according to Dr. Mead. Because of its adaptability to new environment, it is not impossible to assume that even the arid Southwest and southern California may not be immune to the establishment of this pest. Mexico certainly seems vulnerable in certain sections. Dr. Mead concluded with remarks on the apparent futility of attempting to eradicate *Achatina* and the many problems and difficulties of carrying on biological control successfully. Legislation and complete and conscientious inspection are badly needed to keep *Achatina* out of the country—something we have little or nothing of

now, except in California where there is an efficient and rigid inspection system, Dr. Mead said.

The first paper on Saturday was by Mr. Edward Danehy of Stanford and member of the Stanford Grotto, National Speleological Society. He spoke on cave explorations made by him and members of his group in the limestone caves of the Mother Lode area of California and of collecting snails among other things in some of these caves. He concluded by reporting on the sea caves of Ana Capa and Santa Cruz Islands under the auspices of the recent J. W. Sefton Foundation Channel Islands Sea Cave Expedition, and by showing a splendid motion picture in color taken during the expedition. In comment on this presentation, Mr. Smith stated the snails taken by the cave explorers of Stanford were being worked up by him. He mentioned one lot of small snails, probably fossil, that may turn out to be a genus and species new in North America. Mr. Kanakoff spoke of the studies of material from one of the caves on Ana Capa Island, including bones of the sea otter, on which the anthropologists of the University of Southern California are now working.

The second morning speaker was Mr. Ernest N. Wilcox of San Luis Obispo who talked briefly and interestingly on the more striking species of mollusks of Morro Bay. Morro Bay is the meeting space for several species from both more southern and more northern habitats, according to Mr. Wilcox. In answer to a question from Dr. Hill, Mr. Wilcox said that Japanese oysters (*Ostrea laperousii*) had been planted in Morro Bay but had not propagated. Mr. Sorenson remarked that collecting in Morro Bay was far different 15-20 years ago and today was not half as good. He said that during World War II the government had dredged the northern half of the Bay and had also built two jetties, which had created a narrow channel causing swifter water that had washed away much of the original bay mud. This has affected the ecology of the entire bay. In one area, he said, enough mud had been washed away to expose the siphons of geoducks (*Panope generosa*) for a depth of two inches or more, making them an easy prey to all sorts of enemies, especially clam-diggers.

Following lunch the first speaker was Dr. A. Myra Keen whose subject was the classification of the pelecypod super-family Veneracea. Dr. Keen proposed a somewhat more up-to-date arrangement of the super-family into four families—Veneridae, Petricolidae, Cooperellidae, and, doubtfully, "Oncophoridae", a fossil group. At least 260 names have been proposed as subdivisions of the Veneracea, which, by treating part as subgenera, can be reduced to 81 genera, a few being fossil only. The largest of the families, the Veneridae, can be arranged into 11 subfamilies split into two series depending upon the presence or absence of an anterior lateral tooth in the hinge system. Dr. Keen proposes a new subfamily, the Chioninae, with *Chione* as the type genus, as one of the 11 groups. A comparative table of the Veneridae of Western North America giving Dall's assignment of genera and species in his Bulletin 112 of the U.S.N.M. and a new generic assignment of species was suggested by Dr. Keen. The speaker's points in favor of her proposed arrangement were made more graphic by slides thrown on the screen.

The next speaker, Dr. Albert R. Mead of the University of Arizona, discussed the recent introduction of the European Brown Snail (*Helix aspersa*) into Arizona. Professor Mead pointed to the ease with which this snail pest had been introduced into Tucson in the arid Southwest, and to the rapidity of its acclimatization there, as a danger signal for the possible introduction of a worse snail pest, the giant African Snail (*Achatina fulica*), and the need for

appropriate legislation along with constant vigilance to keep it out of the country. He called attention to a law now before Congress that he felt strongly should have all the support that conchologists can give.

After a brief recess, Mr. John Q. Burch discussed the variations in the southern California species of *Haliotis*, with special references to *Haliotis sorenseni*, which the abalone divers are bringing up in some quantity from off the Islands in the Santa Barbara Channel. He illustrated his remarks with a fine exhibit of shells of various sizes. *H. sorenseni*, he said, has a bathymetric range of apparently 100-120 feet. There is evidently a big bed of them off San Clemente Island. In Mr. Burch's dredging experiences, young abalones have been brought up from as deep as 50 fathoms, the limit of the red coralline algae. His hypothesis is that of the deeper water types of *Haliotis*, the young are born toward the deeper end of their bathymetric range. In commenting on Mr. Burch's talk, Mr. Chace spoke of seeing a trailer load of freshly caught abalones in which one in 25-30 was *H. sorenseni*, the bulk being *H. corrugata*. The meat of *sorenseni*, he said, is a distinct orange yellow with some not so yellow, but the divers claim that the meat of all *sorenseni* is yellowish. Mr. Sorensen pointed out that the mantle of the red abalone (*H. rufescens*) is always black while that of *sorenseni* is yellow with brown mottlings. He remarked that the animal of *H. assimilis* is much like *sorenseni* although the shells are quite different. Mr. Smith commented on the difficulty of easy distinction between the smaller species of deeper-water abalones, such as *assimilis*, *aulea*, *kamschatkana*, and possibly *smithsoni* and appealed to those taking them alive to preserve the animals and shells in alcohol for study, first making careful color notes on the animals in their live state.

The next speaker was Mr. Merton E. Hinshaw, Curator of the Pacific Grove Museum, whose subject was the preparation of museum specimens from latex. Mr. Hinshaw explained his method in some detail and illustrated it with latex preparations of the giant keyhole limpet (*Megathura crenulata*) and of the red abalone. Mr. Hinshaw works from living specimens from which he produces a plaster cast. The result is remarkably lifelike when the latex reproduction is taken from the plaster and painted the natural colors of the living animal and shell. Mr. Hinshaw showed himself to be a master technician with this type of reproduction which provides a permanent exhibit that will not deteriorate with time. The discussion which followed turned toward the considerable difficulty of getting the animals of mollusks properly relaxed for final preservation. Mr. Smith suggested quick deep freezing as one possibility, pointing out that Dr. Hanna of the Academy of Sciences had used this technique on nudibranchs with some success. Mr. Weber called attention to a booklet on preparatory methods published by the Naples Museum, which he thought could be obtained from the American Museum of Natural History. Dr. Hill remarked that the Smithsonian Institution had published a handbook for relaxing animals, using the same methods as those at Naples, but that this reference was now out of print.

Mr. Sorensen, recalling the previous discussion on abalones, stated that he had a specimen of the red abalone in his collection measuring 11 inches across the back and weighing about 5 pounds. He expressed the view that this species does not exceed 12 inches in length in spite of reports to the contrary, and made a substantial cash offer for a shell of this or greater length.

Dr. Hill exhibited a scalariform living specimen of the common European Brown Snail (*Helix aspersa*), from southern California. Mr. Smith said that while Taylor in his monograph on British land mollusks reported scalariform

individuals to have been collected occasionally, this was the first one to his knowledge that had been found in North America, although perhaps half a dozen left-handed specimens had been collected in California.

The evening meeting was preceded by the Annual Banquet, arrangements for which were well and capably handled by Mrs. Rose Burch. Place cards supplied by Dr. Myra Keen were each decorated with a colorful valve of the southern California fan-shell (*Pecten monotimeris*). Members and guests were each presented with two favors—one, a large Philippine land snail, *Camaena monochroa* (Sowerby), with the animal reproduced in lifelike proportions in hard clay, furnished also by Dr. Keen; the other a printed reproduction of both sides of an authentic postal card representing Volume 1, Number 1 of The Conchologists Exchange, forerunner of The Nautilus and issued in 1887. (Copies may be obtained as long as they last, by writing Mr. Allyn G. Smith.) The Chairman introduced, as guests, Dr. J. W. Robertson of Livermore Hospital (the evening speaker) and Mrs. Robertson; and Miss Rosalind Keep and her brother. The banquet was informal and there were no speeches.

Following the Banquet the group adjourned to the Recreation Hall where Dr. Robertson presented his splendid color motion-picture film on Tide-Pool Life. Dr. Robertson's remarkable close-ups of scores of different types of marine life have rarely if ever been equalled and at the end of the film everyone present realized they had been given a real treat. A special vote of thanks was given Dr. Robertson for coming to the meeting with his film which represented years of careful and painstaking work at Monterey and Guaymas.

The business meeting on Sunday, June 24, was opened by the Chairman, Dr. Hertlein, who called for the report of the nominating committee. Mr. Fox responded that his committee had made the following selections to serve as officers of the Pacific Division for the ensuing year: Chairman, Dr. Wendell O. Gregg; Vice-Chairman, Mr. Allyn G. Smith; Secretary-Treasurer, Mrs. Elsie M. Chace. Mr. Sorensen moved that the Secretary cast a unanimous vote for the new officers as recommended by the nominating committee. Seconded and carried unanimously.

Mr. Sorensen moved and Dr. Hill seconded a motion to extend a rising vote of thanks to the Chairman and the Secretary-Treasurer and to Mr. Ralph Fox for his work in handling the arrangements for the Fourth Annual Meeting of the AMU—Pacific Division. Carried by a unanimous standing vote.

The Chairman pointed out that the Councillors-at-Large consist of the four past Chairmen of the Pacific Division. These are now Miss Ruth E. Coats of Tillamook, Oregon, Mr. John Q. Burch of Los Angeles, Dr. A. Myra Keen of Stanford University, and Dr. Leo G. Hertlein of the California Academy of Sciences at San Francisco.

The first speaker following the business meeting was Mr. Ralph Fox of Berkeley who gave a brief and interesting history of the American Malacological Union and its California members. Mr. Fox spoke of the first meeting of the Union in 1931 and of its formation resulting from the work of Norman W. Lermond, of Thomaston, Maine. The first published membership list contained 212 names of which 35 were from California. This was in 1933. The last list, published in 1950 shows 63 California members. The Pacific Division was organized in April, 1948; its second meeting was at Long Beach in 1949; and its third was at Santa Barbara in 1950.

Mr. Fox said also that there seemed to be interest enough in the San Francisco Bay Region to warrant the formation of a local Shell Club, similar

to the active clubs in Los Angeles and Long Beach. Anyone interested in joining such a club should contact Mr. Fox.

The final talk of the session was given by Dr. Gregg, who spoke on preliminary studies of the West American Amnicolids in which he is actively engaged. Dr. Gregg reviewed the work of earlier conchologists on these small and difficult fresh-water snails and gave his views on the present state of their classification, based primarily on the anatomy of the animals. According to Dr. Gregg the Amnicolids of the Colorado Desert present many problems, not the least of which is the necessity to work on the radulae and other soft parts of the tiny animals. He is considering the preparation of a monograph on the West American species.

Before adjournment, there was much discussion of Senate Bill 1489 introduced by Senator McFarland on May 15, 1951 and referred to the Committee on Agriculture and Forestry. Dr. Albert R. Mead, who sponsored the bill to prevent the entry of *Achatina fulica* (the Giant African Snail) into the continental United States, led the discussion. The bill, as introduced, reads as follows:

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of Agriculture shall establish such facilities for, and prescribe such regulations governing, the inspection and treatment of produce, baggage, salvaged war materials, and other goods entering the United States from areas infested with any terrestrial or fresh-water mollusk, as he considers necessary to prevent the entry of such mollusks into the United States. Whoever violates any such regulations or imports such a mollusk into the United States shall be fined not more than \$500 or imprisoned not more than one year, or both. The term "United States", as used in this Act in a territorial sense, means the forty-eight States, the District of Columbia, the possessions of the United States (except those which the Secretary of Agriculture finds are infested with such mollusks), and the Canal Zone.*

Dr. Mead said he was positive some such law was needed to keep mollusk pests out of this country and called for comments. It was pointed out that the bill as written might easily be interpreted to prevent the importation of scientific collections of shells and the exchange of specimens either preserved dry or in wet preservatives. The suggestion was made to insert the word "living" in the bill at the proper place to take care of this situation. It was pointed out in this connection, however, that mollusks supposedly preserved in a dry state could not always be considered as "dead", since there have been many records of land snails remaining alive in hibernation in collections for periods of several years. One member said that the bill also should not prevent the importation of living material for scientific study similar to that being done by the U. S. Bureau of Public Health.

After considerable discussion, Mr. Sorensen finally suggested that the question be left in Dr. Mead's hands. Dr. Mead replied that he believed he had a thorough view of the wishes of the members and that he would be glad to proceed on this basis without any formal action on the part of the Division. The matter was finally concluded with a motion (by Mr. Burch) which was seconded and carried as follows:

That the Secretary write a letter to Senator McFarland expressing the wishes of this organization to the effect that the Pacific Division of the American Malacological Union favors passage of a bill to prevent the importation of live mollusks likely to become pests or to endanger health; that the Division

University of Arizona and will support any recommendations he may make to bring about satisfactory legislation of this nature.

In the preliminary announcement of the Fourth Annual Meeting, members were urged to bring any shells they would like to exhibit. Cases were made available for this purpose and a number of interesting exhibits were contributed.

The Chairman, Dr. Hertlein, in his closing remarks, expressed the appreciation of the Pacific Division for the excellent cooperation of the Mills College people in making our stay comfortable and pleasant in every way. He said that special thanks were due to Ralph Fox, Mrs. Burch, Dr. Keen, Mr. and Mrs. Chace, Mr. Strohbeen, Mr. Smith and others for their part in the arrangements, and to all those who had prepared and delivered talks and papers.

ALLYN G. SMITH, Secretary

## **MEMBERS AND GUESTS PRESENT AND REGISTERED AT THE FOURTH ANNUAL MEETING**

Mr. and Mrs. Robert R. Alexander, San Diego  
Mrs. Betty Babbitt, El Cerrito  
Mr. and Mrs. John Q. Burch, Los Angeles  
Miss Helen A. Burton, Oakland  
Mr. and Mrs. Emery P. Chace, Lomita  
    Mrs. Effie M. Clark, Castro Valley  
Mr. Edward Danehy, Stanford University  
Mr. Frank P. Felice, Woodside  
Mr. and Mrs. Howard L. Fletcher, Redlands  
Mr. Ralph O. Fox, Berkeley  
Dr. Wendell O. Gregg, Los Angeles  
Mr. George Harrington, Palo Alto  
Dr. Leo G. Hertlein, San Francisco  
Dr. and Mrs. Howard R. Hill, Los Angeles  
Mr. Merton E. Hinshaw, Pacific Grove  
Dr. and Mrs. George A. Kanakoff, Los Angeles  
Dr. A. Myra Keen, Stanford University  
Miss Rosalind A. Keep, Oakland  
Dr. Albert R. Mead, Tucson, Ariz.  
Col. Lee O. Miles, Oakland  
Mr. and Mrs. Louis B. Mousley, San Bernardino  
Mr. Arthur C. Price, Hollywood  
Mr. and Mrs. William Roth, Palo Alto  
Mr. John G. Saxby, San Francisco  
Mr. Allyn G. Smith, Berkeley  
Mr. Andrew Sorensen, Pacific Grove  
Mr. and Mrs. John P. Strohbeen, Santa Cruz  
Miss Sylvia G. Stewart, San Bernardino  
Mrs. John K. Tompkins, Pasadena  
Mr. Jay A. Weber, Miami, Fla.  
Mrs. A. T. Whelchel, Pacific Grove  
Miss Ruth Whitney, Los Gatos  
Mr. and Mrs. Ernest N. Wilcox, San Luis Obispo  
Mr. Jerry Zeller, El Cerrito  
Mrs. Lucille Zellers, El Cerrito

## OUR MEMBER CLUBS

### BOSTON MALACOLOGICAL CLUB, Miss Margaret F. Farrell,

**Secretary-Treasurer:** The Boston Malacological Club had a very successful 1950-1951 season with meetings on the first Tuesday of each month October through May at the Massachusetts Audubon Society Library, 155 Newbury Street, Boston.

As several members of the Club are affiliated with the Museum of Comparative Zoology at Harvard, the most up-to-date information on mollusks is available to the members.

The following was the program for the year:

October—Summer activities of members, Speaker, Mr. William J. Clench; Subject, Trip to Cuba.

November 1950—Speaker, Dr. George Moore of University of New Hampshire; Subject, Nudibranchs of New Hampshire.

December 1950—Speaker, Dr. Richard Howard, Professor of Botany at Harvard University; Subject, Interesting Collecting Localities in the West Indies.

January 1951—Speaker, Mr. J. Lockwood Chamberlain; Subject, Collecting in the Hudson Bay Area.

February 1951—Speaker, Members of the Club; Subject, Interesting and unusual Shells.

March 1951—Speaker, Mr. Thomas Pulley; Subject, Shell Collecting on the Texas Coast.

April 1951—Speaker, Mr. William J. Clench; Subject, Distribution of West Indian Land Shells.

May 1951—Speaker, Mr. Richard I. Johnson; Subject, History of Early Books on Shells.

The Club had a very successful annual outing and field trip to Rye Harbor State Park, New Hampshire, on Sunday, June 17th.

#### 1950-1951

Miss Ruth D. Turner

Dr. Austin W. Cheever

Miss Margaret Farrell

Mr. J. Lockwood Chamberlain

Mrs. F. K. Hadley

#### President

Dr. Austin W. Cheever

#### Vice-President

Mr. Herbert Athearn

#### Secretary-Treasurer

Miss Margaret Farrell

#### Conchological Recorder

Dr. Joseph C. Bequaert

#### Executive Committee

Mr. Arthur Clark

**NEW YORK SHELL CLUB, Dr. Walter H. Jacobs, Secretary:** Our third year finds us firmly established with a membership of more than 50 and a growing awareness of the diversity of our field. Our interests and activities have become more varied and more scientific, so that our club now provides room for all phases of molluscan study, from the purely aesthetic to the rigidly scientific. Our meetings are planned to make room for everyone. An outline of the papers read during the year will illustrate this.

At various meetings descriptive outlines of the following molluscan groups were presented: Murex (Anthony D'Attilio and Morris K. Jacobson), Fulgur (E. Sidney Marks), Natica (Fred Tobleman) and Xenophora (Anthony D'Attilio). In a short paper on the Nassas, Mr. Jacobson made note of an internal columellar lamella that seems not to have been reported previously. This feature may provide a basis of classification of this difficult group. He also pointed out that the Bullia from South Africa do not show this lamella whereas those from South America do, and hence suggested that the former might have to be removed from the family Nassidae. Collecting trips were described by Frank Hausman (California), S. A. DeLude (Florida), Nick Katsaras (Cuba and Florida) and M. K. Jacobson (Mexico). Mr. George Jacobs gave a particularly enjoyable talk on the "Meaning of Generic Names" and Dr. Walter Jacobs entertained us with slides of X-ray photographs of some familiar shells. Mr. Joseph Fiorino talked philosophically on the habits of Xenophora. In the course of the year Mrs. Dorothy Freas completed her valuable report on the Brooklyn Conchological Society, one of the fore-runners of the A.M.U. Our best attended and most successful meeting was the one at which Dr. Jerome Schweitzer presented his matchless color film of undersea life personally taken at the Virgin Islands. At this meeting the crowd was so large that guests and even some members had to be turned away. Two more numbers of our mimeographed NOTES appeared, one with some excellent illustrations of Murex done by Miss Cecilia Staples. Due mainly to the energy and ability of Mrs. Jo Wichern, the Club held a very successful exhibition of shells in the main lobby of the Queensborough Public Library in Jamaica. All these events were appropriately recorded in photos by the indefatigable Mr. E. Carswell. Our May field trip to Bayville, Long Island, was successful in bringing us a wonderful time and 30 different species, the most interesting being *Polinices triseriata* (unbanded form) and *Acmaea testudinalis fergusoni*.

During this year the club was saddened by the sudden passing of two of our most valued members, Mr. E. Sidney Marks, a charter member, and Mr. Joseph Fiorino. We will all sadly miss the presence of these two active and devoted gentlemen.

We are planning a full active year ahead under the old leadership and hope to report big things in 1952.

**LONG BEACH SHELL CLUB, Ralph Bormann, Secretary:** The Long Beach Shell Club has acquired ten new members during the past year, and interest is growing steadily. We hold monthly meetings in the Main Library in Long Beach, and are working on a project to have a collection of shells in the meeting room.

The annual Christmas party was held in the home of Mr. and Mrs. Fred E. Barnett, Mrs. Leona Lindeman and Tim Barnett assisting in making the party very enjoyable. Gifts were exchanged and a covered-dish supper followed.

These officers were elected for the 1950-51 season: President, Mr. Harry Farmer; Secretary and Treasurer, Mr. Ralph Bormann; Librarian, Mrs. E. P. Baker; Historian, Mrs. Ralph Bormann.

We had no organized collecting trip this year, but several groups made trips to Mexico to collect, among them Mr. and Mrs. H. Arden Edwards, Mr. and Mrs. Howard L. Fletcher, Mr. and Mrs. Harry R. Turver and Mr. and Mrs. Redfern.

Mr. Turver is supervising the building of a laboratory of Paleontology for the Standard Oil Company. Several teachers in the group have helped to interest the children in the study of shells. They include Mrs. Harry Farmer, Mrs. Claude Lehman and Miss Edith R. Rex. Miss Julia Ellen Rogers, sponsor of the Long Beach Shell Club, is having another edition of her work, "The Shell Book," published. Mr. John Q. Burch is handling it, and the nomenclature has been revised by Dr. Harald A. Rehder of the Smithsonian Institution. Captain Fred Barnett as skipper of the California State Fish and Game boat the "Scofield" and later as captain of the "Kuru" collected many fine specimens from deep water off Monterey and Mexico. The Barnetts are preparing an article to appear in *The Nautilus* on the many rare finds.

In July we had a covered-dish supper at the home of Mr. and Mrs. Ned Baker at Downey, California. Mr. Baker has a nice little museum and library. Afterwards pictures of seashore life were shown by the host.

**THE CONCHOLOGICAL SECTION, BUFFALO SOCIETY OF NATURAL SCIENCES, Margaret C. Teskey, Secretary:** All of the 1950-51 meetings were held at the home of Mr. and Mrs. Harold R. Robertson, due to the illness of Mr. Robertson. It was a full year. One meeting was scantilly attended due to a sleet storm which coated the streets with ice, and a summer picnic was driven indoors by unscheduled rain which failed to dampen spirits or curb appetites.

Planning for the 1951 convention of the American Malacological Union (at which time the Conchological Section was to serve with the Buffalo Museum as co-host began early and was a prominent feature of each meeting.

Two 'beach parties' were enjoyed, upon which occasion duplicate shells from the Robertson collection and from other sources were 'collected' by eager members.

"Captain" Adlai B. Wheel and Mrs. Wheel were guests at the September meeting. Mr. Wheel related experiences connected with the nature appreciation classes which he conducts in the boy's clubs with which he is affiliated.

On another occasion a skit entitled, "A Section is Born," was much enjoyed. Written by Miss Gertrude M. Weber and under her direction presented by as hilarious a cast as ever trod the boards, it depicted the organization of the club well over fifty years ago. Miss Jennie Letson and Professor Amadeus Grabau were prominent characters, well remembered by two delighted spectators who were themselves portrayed. Mrs. Annie Cureton Hoffman and Mrs. Imogene Strickler Robertson. Both are charter members of the Conchological Section, Mrs. Hoffman being present at the organization meeting in 1897.

The second annual exhibition of shells owned and arranged by club members (Miss Louise W. Becker, exhibition chairman) was displayed at the Buffalo Museum of Science during August, 1950.

These papers were presented during the season, accompanied by a display of the discussed shells: "Date Shells," Mrs. Harold Robertson; "The Pecten Shell's Story," Mrs. Nellie Sanborn; "Sinistrals and Aberrants," Miss Louise Becker; "Shell Analogues," Mrs. Margaret Teskey; "What is a Shell Rarity?" Miss Jean Russell; "The White Clams," Mrs. Fred Hoffman; "Internal Shells," Mrs. Harold Robertson and Mrs. Margaret Teare.

Four members joined the Section during the current year, and one was lost by death. Mrs. Nellie C. Sanborn was stricken and left a most

active and useful life in April, 1951. And since the close of the year, another faithful member and beloved friend left us when Mr. Harold R. Robertson succumbed to a long and painful illness on July 15th, 1951. An account of his long association with the Conchological Section and with the American Malacological Union appears elsewhere in this bulletin.

At the present time, monthly meetings are held at the Museum of Science, and visiting conchologists are cordially invited to attend.

### **CLENCH CONCHOLOGICAL CLUB, WORCESTER, MASS.,**

**Mrs. G. H. Schmierer, Secretary:** Our club enrollment for 1951 stands at nineteen. We had a satisfactory and worthwhile year's work together, with emphasis on study in the field of identification and life habits of specific mollusks.

Two papers were read by members over radio station WTAG on the subjects of "Snails" and "Oysters." Papers were presented by members before the club on Pectens, Oysters, Abalones, Strombus and Murex. These papers were accompanied with representative shells and descriptive material, hence were especially rewarding.

J. Lockwood Chamberlain of Harvard University gave an interesting talk on the Hudson Bay region, bringing along shells for our inspection which he had collected in that far northern territory. In May the club was cordially entertained by Mr. and Mrs. Frank Hadley, shell dealers of West Newton, Mass. We saw their excellent private collection as well as the shells in their sales room.

We were invited to participate in the Worcester County Conservation Exhibit which attracted wide attention. Our display booth used as background a large map of the world. Specimen shells were arranged on either side, with colored ribbons leading from each shell to its home location. A sand and shell-covered table in front of the map invited inspection of other less spectacular shells, while in the very front was a large open Tridacna holding an assortment of smaller common shells. This was used as a "grab" for the children and proved immensely popular. Hundreds of children asked thousands of questions as they milled about the table. The exhibit stimulated interest in shells and in the club, and we gained several new members.

We look forward to the new year with enthusiasm, for several papers are already in the making and our curator and president are busy lining up speakers and planning activities for the months ahead.

**The 1952 Convention  
of the  
American Malacological Union  
will be held in  
Cambridge, Massachusetts  
Exact August date and hotel facilities will be announced later.**

## ACTIVE MEMBERS

- Abbott, R. Tucker, U. S. National Museum, Washington 25, D. C.  
Abdel-Malek, Emile T., Museum of Zoology, Ann Arbor, Mich. Anat. of f. w. snails.  
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Ancona, Prof. Ignacio, Instituto de Biologica Casa del Lago de Chapultepec, Mexico D. F.  
Anderson, Col. A. S., 504 Carroll St., Dothan, Ala. Worldwide shells.  
Anderson, Miss Eva M., 7220 Lincoln Dr., Philadelphia 19, Pa.  
Anderson, Miss Katherine M., Box 206, Chillicothe, Ohio. Pecten, Murex.  
Andrews, Elizabeth, 605 Pershing Dr., Silver Spring, Md. Col. on outer banks, N. C.  
Andrews, Mrs. James N., Somerset, Va.  
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Conkling, Joseph E., Box 264, Edgartown, Mass. Winter, 628 4th Ave., S., St. Petersburg, Fla. Collect, buy, exchange.  
Copsey, Jack Edward, Pacific Marine Sta., Dillon Beach, Cal. Mollusks as hosts for larval trematodes.  
Corbett, William Phelps, 185 Grove St., Plainfield, N. J. Exch. rare *Cypraea*, *Murex* and *Oliva*.  
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- Fargo, William G., 506 Union St., Jackson, Mich. Dec. to May, P. O. Box 874, Pass-a-Grille, Fla. Tertiary mollusca.
- Fletcher, Mr. and Mrs. Howard L., 908 Crescent Ave. B, Redlands, Cal. Coll. *Murex*, *Olividae*, and *Calliostoma*.
- Flipse, Mr. and Mrs. Robert C., 80-56 Surrey Place, Jamaica 3, N. Y.
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- Foster, Mrs. Fred H., Oxford, Ind. Shells in general.
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- Freas, Mrs. Allan L., 8935 86th St., Woodhaven 21, N. Y. Land and f.w. shells.
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- Gardner, Dr. Julia, U. S. Geological Survey, Washington, D. C.
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La Rivers, Ira, Dept. of Biol., Univ. of Nevada, Reno, Nev. Great Basin f. w. mollusks.  
LaRocque, Dr. Aurele, Dept. of Geology, Ohio State Univ., Columbus 10, O. Fresh water shells; also Pleistocene and Post-Pleistocene.  
Larsson, Evert Alfred, M.D., Sta. A., Trenton, N. J. General collecting.  
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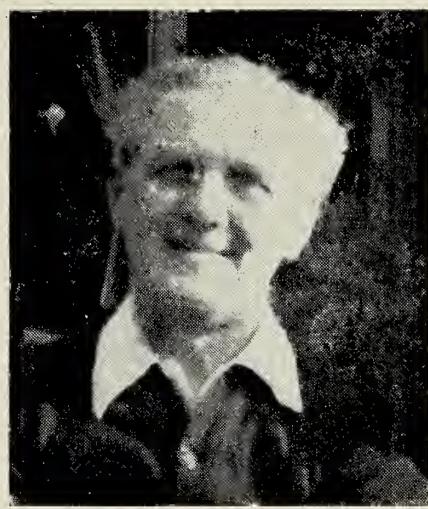
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## **HAROLD RALPH ROBERTSON**

**(See article on page sixteen)**

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## **IN MEMORIAM**

MICHAEL C. E. DAMRON

DR. HAROLD HEATH

DR. FRANK M. MacFARLAND

\*E. SIDNEY MARKS

\*HAROLD R. ROBERTSON

\*Charter Member

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**THE AMERICAN MALACOLOGICAL UNION  
EXECUTIVE COUNCIL**

**1951-1952**



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# THE AMERICAN MALACOLOGICAL UNION

CONSTITUTION ADOPTED 1931

1. This society shall be called "The American Malacological Union."
2. Its object shall be the promotion of the science of malacology by holding meetings for reading and discussion of papers, and for furthering the interests of students and collectors of shells by facilitating acquaintance and co-operation among the members.
3. Membership shall be limited to persons resident in the Americas and Hawaii. New members may be proposed by two members and balloted for by the Council. They shall pay an annual subscription (dues) of \$1.00. They will receive without other charge all notices, programs, lists of members, etc., issued by the Union.  
NOTE: In practice the Council ballots have been delegated to the Secretary.
4. The following officers shall be elected annually by ballot: President, Vice-President, two Secretaries and Treasurer.
5. The Union will be governed by a council consisting of the officers and four other members to be elected annually by ballot.
6. The annual meeting shall be held at such time and place as may be fixed by the preceding annual meeting. Other meetings may be called by the Council. Meetings of local branches may be held as such branches may determine.
7. Proposals for the alteration of this constitution when signed by five members and passed by the Council shall be acted upon at the next annual meeting. Concurrence of three-fourths of the ballots cast is necessary for any alteration.
8. The NAUTILUS is hereby designated as the official organ of the Union.

## RESOLUTIONS

That there be an honorary membership for such as have contributed in an outstanding way to American conchology.— Adopted May 26, 1932. (The late Charles Torrey Simpson, Bryant Walker, and Victor Sterki were honorary members).

That there be a corresponding membership for those not resident in the Americas.— Adopted May 26, 1932.

That the Council shall consist of the officers, honorary and past presidents, and members at large not to exceed four. Members of the Council present at any annual meeting shall constitute a quorum.— Adopted August 3, 1937.

That the Chairman of the Pacific Coast Branch be a Second Vice-President.— Adopted August 26, 1948.



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# The American Malacological Union

## ANNUAL REPORT 1952 EIGHTEENTH ANNUAL MEETING



## PACIFIC DIVISION (A. M. U. P.) FIFTH ANNUAL MEETING

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Membership List Revised, December 1952

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## THE EIGHTEENTH ANNUAL MEETING OF THE AMERICAN MALACOLOGICAL UNION

Several prominent malacologists have claimed Boston as their birthplace. Many more, born outside New England and sometimes outside of the country, have elected to receive their education at Harvard University, and there remained to live out their days acquiring and imparting knowledge in that branch of natural science so fascinating to the initiated, so incomprehensible to the outsider.

Therefore an infiltration of some eighty malacologists, students all, regardless of age or station, caused hardly a flurry on the staid old campus and no excitement whatever in the lovely town of Cambridge, somnolent at the end of an especially torrid summer.

Wednesday, August 20th, 1952, was the official opening date of the eighteenth annual meeting of the American Malacological Union. However, the vanguard appeared days ahead of schedule, arriving one or two at a time and intent on "doing" Boston before the real business of the week got under way. Hotel Commander, located near Harvard Square and at the site of the famed Washington Elm had been selected as convention headquarters, and catered with remarkable efficiency to the early arrivals and to the influx of delegates which reached its height before noon on Wednesday.

Early and thorough planning began to pay off when Mr. William J. Clench, Curator of the Museum of Comparative Zoology, and his able assistant, Miss Ruth D. Turner, greeted their guests at registration time. Desks were set up in the lecture hall of the geology department, and there delegates signed, received identification badges, then spent the remainder of the forenoon in greeting old friends and making new ones.

At lunch time many made their way to Young Lee's Chinese restaurant on Harvard Square. This was especially fitting, since it was there that Mr. Clench and Mr. Norman W. Lermond planned the organization of the American Malacological Union in 1930; "We worked it out over plates of chop suey!" recalls Mr. Clench.

At 2:00 P.M., Wednesday, August 20th, the meeting got under way when President Jeanne S. Schwengel rapped for order and introduced Dr. Alfred S. Romer, Director of the Museum of Comparative Zoölogy. Dr. Romer voiced a gracious welcome to the Union, expressing the hope that the meeting would be most successful. He then volunteered an answer to the question which each of his listeners must have asked himself at one time or another, namely, why is this place called the Museum of Comparative Zoölogy? That, said he, is a \$50,000 title. For it was this sum which Francis Grey advanced as an endowment upon the supplication of Louis A. Agassiz, with the Deed of Gift carrying the proviso that the name of the new organization appear exactly as it does today, 125 years later. Not a letter may be changed, no addition made, lest the heirs of Francis Grey are richer and the MCZ poorer by a sadly-needed \$50,000! Dr. Romer closed his brief remarks with this sincere invitation: "Come again, any time!"

Dr. Schwengel thanked Dr. Romer for his invitation and for the hospitality being enjoyed by everyone. She then advised her fellow-members to take every opportunity to explore this great museum, not only the malacological exhibits, but, as she observed, "All you have to do to get here is to mention the glass flower display to any taxi driver!" She then introduced the first speaker, and thus launched the academic portion of the eighteenth annual meeting.

## DISTRIBUTION OF MOLLUSKS IN THE GULF OF MEXICO

THOMAS E. PULLEY  
Museum of Comparative Zoology  
(Abstract)

In a careful study of the identity and ranges of 238 species and subspecies of shallow water bivalves found in the Gulf of Mexico, it was found that range limits of the majority of species are not scattered indiscriminately along the coastline, but are concentrated in a relatively few narrow regions of faunal transition. Between the zones of faunal transition are long stretches of coastline in which the fauna shows a high degree of uniformity, and in which few or no species terminate their ranges.

A study of water temperatures, as reported by tide gauging stations along the Atlantic and Gulf coasts, indicates that the zones of faunal transition are also zones of temperature transition in which the mean minimum winter temperature or mean maximum summer temperature changes at a rate of 8° to 12° F. per hundred miles. In the regions marked by faunal uniformity, however, the rate at which the temperature varies is approximately 1° F. per 100 miles. Areas in which the rate of change is 4°-5° F. per hundred miles are shown to be areas in which the ranges of many species are terminated at scattered intermediate points between the more pronounced faunal and temperature discontinuities on either side.

It is proposed that regions of faunal uniformity, bounded on either side by regions of faunal transition, be recognized as faunal provinces and given names. On the basis of the present study, the following provinces are recognized, and their names are here proposed.

Province	From:	To:
1. Nova Scotian	South coast of Newfoundland	Cape Cod
2. Virginian	Cape Cod	Cape Hatteras
3. Carolinian	Cape Hatteras	Cape Canaveral
4. South Florida	Cape Canaveral	Key West and Cape Romano
5. Southwest Florida	Cape Romano	Anclote Keys
6. Northeast Gulf	Anclote Keys	Mississippi River
7. Northwest Gulf	Mississippi River	Matagorda Island
8. Texas Transitional	Matagorda Island	Cabo Rojo
9. Mexican	Cabo Rojo	Cabo Catoche
10. West Indian	The West Indies, Central, and South America to Brazil.	
11. Offshore West Indian	25-100 fathoms in the Caribbean Sea and Gulf of Mexico.	

A peculiarity of temperature conditions in the western Atlantic has made Cape Hatteras the boundary between consistently colder water to the north and warmer water to the south. From Cape Hatteras northward to the Arctic, winter temperatures are uniformly low, and vary only between 30° and 33° F. Summer temperatures, however, range from 53° at Eastport, Maine, to 85° F. at Cape Charles, Virginia. It is apparent, then, that a range limit determined by temperature, and occurring north of Cape Hatteras, must be caused by temperatures of summer.

From Cape Hatteras to Brazil the summer temperatures vary only between 85° and 90° F., while winter temperatures vary from 44° F. at Cape Hatteras to 75° F. in the West Indies and Brazil. It is thus seen that range limits south of Cape Hatteras must be determined by winter temperature conditions.

In studying the physiological reactions of invertebrates to temperature, it has been found that there is an upper and lower limit at which the adult animals can survive. There is also, for most species, a somewhat narrower range of temperature in which reproduction is possible. For a region, then, in which range limits are determined by summer temperatures, northern range limits must occur in localities where the temperature fails to become high enough for reproduction. Southern range limits, on the other hand, must occur in regions which get too hot for adult survival. Inability to reproduce at the peak of summer temperature is not considered to be an important factor in range restriction, because suitable temperatures for reproduction in such an area must occur in spring and fall.

Similar processes of reasoning would indicate that in a region where range limits are determined by winter temperatures, northern limits occur where temperatures become too low for adult survival, and southern limits are caused by failure of temperatures to become low enough for reproduction. Although Cape Hatteras is a region of temperature discontinuity in both summer and winter, and range limits which occur there may be due to either extreme of temperature, it is possible to explain range limits occurring either north or south of the Cape as follows:

**North of Cape Hatteras**

Northern Limit      Not warm enough in summer for reproduction.  
Southern Limit      Too hot in summer for adults.

**South of Cape Hatteras**

Northern Limit      Too cold in winter for adults.  
Southern Limit      Not cold enough in winter for reproduction.

The fauna of a region is thus shown to be closely correlated with the extremes of summer and winter temperatures. If the fauna of a region with unknown temperature characteristics includes species whose temperature requirements can be determined by their range limits elsewhere, it is possible to predict with reasonable accuracy the temperature extremes of regions for which no data are currently available, or for fossil horizons in the late Tertiary or Quaternary in which recent species were present.

Questioning brought agreement from Mr. Pulley that although his investigation was concerned chiefly with water temperatures, other factors were doubtless as important. He explained that a particularly depauperate region charted from Cape Hatteras to Cape Henry was caused by the fact that there is a sharp winter break at that area. "Between Hatteras and Delaware Bay there is an annual range of 50°. A mollusk must be extremely sturdy to survive that!"

## A SHELL COLLECTOR IN TOBAGO

RICHARD W. FOSTER  
Museum of Comparative Zoology

The Kodachrome slides with which Mr. Foster illustrated his talk were of the collecting sites in what must be a tropical paradise. Many of the views were close-ups of the shells themselves, shown in unusually complete detail. He admonished his listeners who might aspire to visit Tobago to prepare to accept the island as the true home of Selkirk's hero Robinson Crusoe, or to be resigned to being forever unpopular with the native population.

## STUDIES OF THE FAMILY PLANORBIDAE

EMILE ABDEL-MALEK  
University of Michigan

(Abstract)

Several species in this family play an essential role in life histories of trematodes responsible for diseases of great concern to public health agencies. The success of programs carried by these agencies depends in a large part on malacological and parasitological studies of the vectors involved. Accordingly attention was given mainly to anatomical, histological, bionomical and host-parasite relations of several of the larger planorbid snails. Such investigations on freshwater pulmonates in general and especially on planorbid snails are scarce in the literature. Details of the results obtained during my studies will be published elsewhere.

This paper was illustrated with charts diagramming extensive research on planorbid anatomy in general and of the reproductive system in particular. Also charted were survival capacities, diets, etc. Since attending the meeting, Dr. Abdel-Malek has returned to his native Egypt, there to assume his duties in the Bilharzia snail-control program with the Egyptian Government.

## NEW ENGLAND MALACOLOGISTS

RUTH D. TURNER  
Museum of Comparative Zoology  
(Abstract)

Though New England has a depauperate molluscan fauna it has long been rich in the production of Malacologists. The list of those who have either been born and received their early training in New England or who came from elsewhere to spend most of their career in this area is quite impressive. There appears to be several reasons why New England became one of the first centers of importance in Malacology and why it has continued to be so to this day. Among these was the early development of trading and industry in this area bringing wealth and leisure to men who then had time and means to follow and support such scientific interests. The foundation of Harvard College and the Boston Society of Natural History brought these men together and gave leadership for the young. The early publication of books on the area such as A. A. Gould's "Invertebrata of Massachusetts" interested many young people in this field and the various journals furnished an outlet for the publication of their researches. Perhaps the most important was the development of the Museum of Comparative Zoology under the leadership of Louis Agassiz, a remarkable teacher who attracted students from all over the country and whose spirit and method of teaching has continued in the field of mollusks to this day.

First among the famous New England malacologists was Amos Binney whose great work "The Terrestrial Air-Breathing Mollusks of the United States" set a pattern for future students. August A. Gould was probably one of the most important malacologists this country has produced as his "Invertebrata of Massachusetts" started many young men on a career in the field of Zoology. Joseph Pitty Couthouy is probably best known as the malacologist on the United States Exploring Expedition. Jesse Wedgewood Michels is remembered as one of the founders of the Portland Society of Natural History and for his work on local and Hawaiian land shells. Charles Baker Adams was outstanding for his work on Jamaican and Panamic mollusks and his stimulation of others in the field of mollusks. William Green Binney, following in his father's footsteps, did his main work in North American land shells, contributing greatly to our knowledge of anatomy and distribution in this group. He also realized at an early date the importance of compilation and his "Bibliography of North American Conchology" is one of the most important reference books of its kind. Thomas Bland, coming under the influence of C. B. Adams, became interested in West Indian land shells and later worked with W. G. Binney on the land mollusks of North America. Most of the Binney, Bland and Adams material is now in the collection of the Museum of Comparative Zoölogy. John Thomson of New Bedford is one of the most famous of the many masters of trading and whaling vessels who were bringing home material from all over the world to the museums and private collections of this area. In addition, material was coming in from missionaries, most of whom were from New England. Such was the interest in New England at the time Louis Agassiz planned to visit this country. Before his arrival arrangements had been made for Agassiz to give a series of lectures for the Lowell Institute in Boston and so it was that he came first to Boston, never to leave the area. From that time on his influence on the zoological sciences in this country were profound. Count Louis Pourtalés came with Agassiz to this country and assisted him in his laboratory then located in East Boston. Later he was employed by the United States Coast Survey and because of his work may well be called the father of deep sea dredging in the United States. Pourtalés Plateau, off the south coast of Florida, was named in his honor. With the foundation of the Lawrence Scientific School at Harvard and later the development of the Museum of Comparative Zoölogy, Cambridge became the center of training and research in zoology in New England. Among the early students of Agassiz, many of whom later founded centers of interest elsewhere, were Addison E. Verrill, Alpheus Hyatt, Edward Sylvester Morse, William Healy Dall and William Stimpson. Agassiz was also responsible for bringing John G. Anthony to New England. He was first curator of mollusks in the museum at Harvard and as a result of his interest in exchanging mollusks with workers all over the world the museum is now rich in material collected and described during his time, much of it being type material. Alexander Agassiz, like his father, also had a great interest in zoology and, though trained as a engineer, he spent much of his time on his favorite study of zoology. Under his guidance and aid the museum continued to grow and his many dredging expeditions resulted in a wealth of deep sea material at the museum. Robert Tracy Jackson, a student of Alexander Agassiz and A. Hyatt, is best known in the field of mollusks for his work on the Phylogeny of the Pelecypods. William F. Clapp met Alexander Agassiz at a very early age and his interest in museum work and zoology developed through his student years. He was in charge of the mollusk collection from 1910 to 1923 when he left to devote full time to the study of

marine boring and fouling organisms and established the Clapp Laboratories at Duxbury, Massachusetts. Charles W. Johnson was not a New Englander by birth but came to Boston on the death of Hyatt as curator in the Boston Society of Natural History. Both W. F. Clapp and C. W. Johnson loved young people and were responsible for encouraging many youngsters in their interests in natural history, particularly mollusks. Among these youngsters was William J. Clench who first visited the museums when still a high school boy. When W. J. Clench became curator of mollusks at the Museum of Comparative Zoology in 1926, he and Mr. Johnson had great plans for the future, but unfortunately Mr. Johnson died in 1932. In his procedure and spirit of teaching W. J. Clench has followed in the footsteps of Agassiz, Clapp and Johnson; he has encouraged people to come and use the collection and has always been surrounded by students, young and old. His informal method of teaching and the spirit of the 'mollusk group' at the museum today may perhaps best be expressed by the 'smoking sessions' on the steps of the museum.

Norman W. Lermond was a New Englander of particular interest for it was he who suggested the formation of the American Malacological Union. It was while working at the Museum of Comparative Zoölogy that he brought up the idea to W. J. Clench, and while lunching at Young Lee's restaurant in Harvard Square they discussed the plans. Lermond was given all possible help and encouragement and by the time he left for a winter in Florida things were pretty well organized. The first meeting was held in Philadelphia but, nevertheless, the roots of the organization were in New England.

As Miss Turner concluded, suggestions came from several quarters that this collection of biographical sketches should be published. She answered that several already have appeared in "Occasional Papers on Mollusks," a publication of the Mollusk Department of the M.C.Z. Dr. Pilsbry observed that he had barely missed being born a New Englander, since his mother was from Rhode Island, his father from New Hampshire.

## THE NUDIBRANCHS OF NEW ENGLAND

GEORGE M. MOORE

University of New Hampshire

(Abstract)

About five years ago, while doing some spring collecting in the tide pools along the New England coast, the writer made his first acquaintance with nudibranch mollusks. His attempts to determine the species revealed a lack of anything but scattered references to the New England fauna. While the writer had hoped to do some ecological and life histories studies, he became sidetracked with the problem of searching out the scattered literature and learning the identity of the fauna.

Nudibranchs are so poorly known because they are a difficult group with which to work. They lack a shell. Their brilliant colors do not preserve. Unless they are carefully relaxed before killing they generally preserve as distorted, unrecognizable masses. They are seasonal and their distribution is spotty.

The kodachromes shown resulted from an effort to capture a record of the living animals on film. The pictures are extreme close-ups with film magnifications ranging from 0.3 to 3.6 times natural size. They have generally been taken of lightly anesthetized specimens using small lens apertures and rela-

tively long exposures. Fifty-one slides representing seventeen different species were shown.

Experimentation with various methods of relaxation and fixing has resulted in the regular use of 8% magnesium chloride as an anesthetizing agent followed by preservation in sea water formalin. By this method it has been possible to fix some material with little shrinkage and distortion. The colors are not preserved by this method.

Dr. Moore presented a series of Kodachrome slides which brought exclamations of wonder from his audience. Answering a question as to the anesthetizing medium used to secure such beautiful photographs, he said that one very simple method which works well consists of adding a small amount of soda water to the dish of sea water. He has found menthol not successful on New England nudibranchs, and of all the media employed, he still prefers magnesium chloride.

The first lecture session was completed with this paper, and a general exodus ensued as delegates hurried to the hotel to relax for a brief period before the annual dinner which was scheduled for 7:00 P.M.

The banquet was served in the Mount Vernon room of Hotel Commander. Miss Ruth D. Turner with the aid of Miss Margaret Farrell, Secretary-Treasurer of the Boston Malacological Club was in charge of general plans and seating arrangements. Mrs. Stanley Olsen of the Museum had beautifully decorated the tables with bouquets of garden flowers in shell vases. Officers, Council members and their ladies occupied a long table across one side of the banquet room, where the ladies were honored with corsages of white chrysanthemums.

The most appreciated touch of all was the place cards. The grotesque little snail figures which adorned the green cards bespoke antiquity, and the printed explanation brought great interest but no surprise. For it was the actual cut used as an end piece in Amos Binney's "Terrestrial Air-breathing Mollusks of the United States," (Vol. I, p. 83, 1851) and had been printed from the original plate. Since printing processes one hundred years ago were not standardized as they are today, the plate was found to be too thin for modern presses, and before it could be used it was necessary to build it up with several thicknesses of cardboard backing. Needless to say, these place cards were highly prized as souvenirs of a most pleasant occasion.

Following the dinner, Dr. Henry A. Pilsbry, pressed to say a few words, expressed his appreciation at seeing so many of his A.M.U. colleagues under one roof; "Since 1931 I have run into them all over the world," said he.

Mr. Clench introduced his guests, Mr. and Mrs. Howard J. Allgaier. When it was explained that Mr. Allgaier is the printer of "Johnsonia," a round of applause testified to wide-spread appreciation of the excellence of his work.

The remainder of the evening was most pleasantly occupied as Dr. Richard Howard, Professor of Botany at Harvard University, entertained with an illustrated lecture entitled, "Jungle Housekeeping." Dr. Howard had served his country as an instructor during World War II, and his unique task was that of teaching members of the Naval Air Force the technique of survival should they be forced down in jungle terrain, or upon a barren beach. His classroom had been a remote island off the coast of Florida which had provided a sample of most of the unfriendly things to be met with under similar circumstances half a world away.

A grim job it must have been, but Dr. Howard made it sound like a hilarious game as he related the adventures of his pupils, especially those of

one Sam, a city lad who had wanted no part of this sort of life. Food and shelter are everywhere if one is trained to take advantage of what is at hand. An important part of the curriculum was recognition of poisonous plants and dangerous wild life, and the Kodachrome slides which illustrated the perils the airmen learned to overcome were extremely interesting.

Dr. Howard concluded with the statement that any young man of draft age possessing scientific inclinations should be advised to investigate the advantages of becoming affiliated with the search and rescue units which are an integral part of the major branches of the armed forces of this country.

As the meeting was called to order at 10:00 A.M. on Thursday, a telegram from Dr. Albert R. Mead was read. It expressed his regret at being unable to be present, sent greetings to his friends and all good wishes for the success of the convention.

## SOME NEW RECORDS OF NAIADES FROM EASTERN NORTH AMERICA

HERBERT D. ATHEARN

(Abstract)

Much work is still to be done in the collecting and study of the distribution of naiades in our extensive river drainages. I wish to include here, a few of the most interesting discoveries that I have come across during recent years.

The Petitcodiac River system of Westmoreland County, New Brunswick, has yielded two outstanding species, uncommon throughout the extent of their range. *Alasmidonta marginata varicosa* Lamarck is fairly common just above Salisbury. Length of specimens run up to 79 mm. The North River, a branch of the Petitcodiac, contains the species *Alasmidonta heterodon* Lea. This should be an important record to add to the few existing records of the species. Additional records for this species which I believe to be new were found in the Scantic River in Hartford County, Connecticut and Hampden County, Massachusetts.

Very few stations for *Margaritana margaritifera* Linne have been reported from Massachusetts and Connecticut. To this short list I can add Salmon Brook, Hartford County, Connecticut and Scantic River, Hampden County, Massachusetts.

In pursuit of the species *Anodonta implicata* Say, I have found that it is very common near the mouth of the Aroostook River, Victoria County, New Brunswick. This station is fully 150 miles from the sea. Other stations taken in the St. John River system, New Brunswick are St. John River, York County; Canaan River, Queens County; and Kennebecasis River, Kings County. Northern records which may be new are McIntyre Lake and Grand Mira River, Cape Breton Island, Nova Scotia.

A survey of the St. Lawrence River drainage for east coast species and eastern records of Great Lakes species has brought about several interesting results. Very definite records of *Lampsilis cariosa* Say have been taken from the Grass River, St. Lawrence County, New York; Madawaska River, Renfrew County, Ontario (a tributary of the Ottawa River); St. Francis River, Yamaska County, Quebec and the Nicolet River, Nicolet and Yamaska Counties, Quebec.

Some extreme eastern records for Great Lakes fauna were taken from the Nicolet and St. Francis Rivers, Yamaska County, Quebec. From the South

Branch of the Nicolet River were taken *Lasmigona costata* Rafinesque, *Ligumia recta latissima* Rafinesque and *Alasmidonta marginata* Say; while from the St. Francis a very brief survey under difficult collecting conditions brought in *Lasmigona compressa* Lea and *Obovaria olivaria* Rafinesque.

Some recent work done in Adams County, Pennsylvania has established some new records not recorded by Dr. Ortmann in his work of 1919. From Marsh Creek were taken *Elliptio productus* Conrad, *Elliptio fisherianus* Lea and *Lasmigona subviridis* Conrad. In the same county, large specimens of *Elliptio fisherianus* Lea and *Lampsilis ovata* Say were taken in Rock Creek.

Following Mr. Athearn's paper, observation was made from the floor that *Margaritana margaritifera* Linne is known to have a long life, sometimes as long as 80 or 90 years. Also, that where extensive mussel surveys have been made, the water in which this species occurs is predominately soft, quite the contrary to that of the Connecticut River, listed as a record by this paper. A single Michigan locality is known for *Alasmidonta marginata varicosa* Lamarck, that of the Ocqueoc River in the lower peninsula.

## NEW FEDERAL REGULATIONS ON IMPORTING MOLLUSKS

R. TUCKER ABBOTT  
United States National Museum  
(Abstract)

The Secretary of Agriculture has set up regulations to comply with Public Law 152, 82d Congress, which concern the importation into the United States and its possessions of certain living mollusks. Details concerning these regulations are found in the Federal Register (7 CFR Part 324, page 6826). The essential points are given in this abstract:

The regulations are aimed chiefly at the giant African snail, *Achatina fulica* Bowdich, but also include any living stages, including eggs, of any species of terrestrial or fresh-water forms of the phylum Mollusca. The regulations call for the inspection of baggage, produce, vessels, vehicles, aircraft, etc., and for the removal or destruction of any living snails.

Entry of certain land snails is permitted but only by special permit which may be obtained by writing to the Chief of the Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, Washington 25, D. C. Except under unusual conditions, say for research purposes by responsible institutions or individuals, no permit will be issued for the entry of living *Achatina* species, *Theba pisana* Müller, or any species of slug.

It may be noted that there is already a law against importing any living species of human disease-carrying snails (especially the fresh-water forms), and that permits for their entry must be obtained from the Surgeon General, U. S. Public Health Service, Washington 25, D. C. Neither of these regulations apply to seashells, other marine mollusks, or any shells which have been cleaned or preserved.

Discussion brought out the fact that these regulations apply to living snails only, and that dealers may obtain special permits to bring in live edible snails, such permits to cover specified shipments. Mr. Abbott expressed the conviction that in 50 or 100 years controls may well be over, for by then universal distribution will have been accomplished.

The morning session ended with a brief showing of Kodachrome slides taken on occasion of the field trip to Niagara Glen, a feature of the 1951 convention held in Buffalo, N. Y.

The annual business meeting was held on Thursday afternoon. A condensed report of the council meeting was read, beginning with the statement that a letter to the council from Mrs. Imogene C. Robertson had been received. She requested that her name not be considered when the president for 1953 should be chosen. (Mrs. Robertson had been elected an Honorary President in 1939, and in 1951 had been elected Vice-President.) The Council had acceded to this request, though with regret, and the following slate of nominated officers was presented:

President, Dr. A. Byron Leonard; Vice-president, Dr. Joseph C. Bequaert; Secretary-treasurer, Margaret C. Teskey; Councilors-at-large, Mr. R. Tucker Abbott, Dr. Carlos G. Aguayo, Miss Ruth E. Coats, Miss Ruth D. Turner.

(Past Presidents and Honorary Presidents remain on the council without re-election.)

A motion was made from the floor that this panel be elected without opposition, the motion was seconded, and a voice vote made the election unanimous.

The announcement was made that by action of the Council, and in recognition of her twenty years of faithful service as secretary of the American Malacological Union, an Honorary Life Membership in the organization had been bestowed upon Mrs. Robertson. Spontaneous applause bespoke complete approval of this action.

The report made to the Council by the Secretary-Treasurer listed a membership of 445 members, and a balance of \$409.14.

Announcement was made of a provision whereby life membership may now be purchased for twenty-five dollars, this sum to be paid at one time.

It was announced that a committee of two (Mr. R. Tucker Abbott, Miss Ruth E. Coats) had been appointed to study the somewhat obsolete constitution, and to draft a clarified version to be presented at the next annual meeting.

Two identical proposals, each bearing several appended signatures, had been laid before the Council, the proposition being to change the name of the American Malacological Union to American Malacological Society. When this proposal was read at the business meeting, views pro and con were briefly stated. Since no action may be taken without a poll of the entire membership, it was moved, seconded and carried that this matter be tabled until the next annual meeting.

This action concluded the business meeting, and the final session of the academic portion of the convention began with reading of the following paper:

#### TRANS-PANAMIC DISTRIBUTION OF THE MACTRIDAE

J. L. CHAMBERLIN  
Museum of Comparative Zoology  
(Abstract)

Closely related species and con-specific populations with their ranges divided by the isthmus of Central America are recognized in many groups of marine organisms. Among the American tropical and subtropical members of the marine bivalve family Mactridae such "trans-Panamic" affinities greatly outnumber relationships with the Mactridae elsewhere in the world.

The American area of tropical and subtropical conditions is defined, for this study, as extending from Lower California to northern Peru in the Eastern Pacific and from Florida to southern Brazil in the Western Atlantic.

In this area the author has recognized 13 genera and subgenera of Mactridae containing 40 species and subspecies. Their distribution is shown in the following table.

### NUMBER OF SPECIES AND SUBSPECIES

	New World Tropics and E. Pacific	New World Sub-tropics* W. Atlantic	Elsewhere Old World	Total (for the world)
<i>Spisula</i> s.s.** .....	0	1	1	5
<i>Simomactra</i> .....	1	1	0	2
<i>Mactrotoma</i> s.s. .....	3	2	0	10+
<i>Mactroderma</i> .....	1	0	0	1
<i>Micromactra</i> .....	6	1	0	7
<i>Mactrella</i> .....	3***	1***	0	3***
<i>Harvella</i> .....	1	1	0	2
<i>Tumbeziconcha</i> .....	2	0	0	?
<i>Labiosa</i> s.s. .....	1	2	0	3
<i>Raeta</i> .....	1	2	0	3
<i>Mactra</i> s.s.** .....	1	2	2	several
<i>Mulinia</i> ** .....	3	2	2	0
<i>Rangia</i> .....	1	2	0	3

\*All species are endemic to the New World.

\*\**Spisula*, *Mactra* and *Mulinia* alone are represented outside the tropical and subtropical regions.

\*\*\**Mactrella alata* Spengler occurs in both the E. Pacific and W. Atlantic.

The table shows that of the 13 supra-specific categories, 10 have species in both the Eastern Pacific and Western Atlantic regions. Only 4 or possibly 5 are also represented anywhere outside this joint area and 3 or 4 of these in the Old World. The fossil record confirms the above distributional pattern. Many more representatives of the groups have been found in the late Tertiary deposits of the American Pacific and Atlantic Coasts. The author has discovered no Old World fossils belonging to any group of Mactridae today restricted to the Americas. Several conclusions are possible from the above data. The striking "trans-Panamic" affinities of the family furnish emphatic living evidence of a former communication of the Atlantic and Pacific faunas. Marine channels are known to have crossed several parts of Central America until late Tertiary times. That the former intercourse was via these marine channels is indicated by the fact that 10 of the groups of Mactridae are restricted today to tropical and subtropical conditions. Genera and subgenera represented on both sides of Central America but nowhere else must have differentiated prior to closure of the channels.

Just when the Central American connections were broken is a critical matter if knowledge of evolution rates is to be gained from this study. Two sources of evidence are available. On one hand, no marine deposits younger than Upper Miocene are known to stretch across Central America (A.A. Olsson, 1932, Bull. Amer. Paleont., Vol. 19). On the other hand, Simpson (1940 J. Wash. Acad. Sci. Vol. 30: 137) has summarized conclusively that the terrestrial mammals of North and South America did not intermingle until late Pliocene times. This strongly implies that a suitable land bridge between the two continents appeared at this time, separating the Atlantic and Pacific Oceans in the low latitudes. It is certainly important to solve the discrepancy whether the Atlantic and Pacific tropical marine animals have been separated for over 16 million years or for only 2 or 3 million. Since the Mactridae show a majority of specific differentiation on the opposite sides of Central

America, they have probably been divided by this land barrier since the late Miocene rather than the late Pliocene.

Realizing that many endemic genera existed at the time of separation, and assuming the time to be Upper Miocene, it is believed that the Western Hemisphere tropics was pioneered by the family at least by fairly early Tertiary times and has received few subsequent immigrants. The American Tertiary fossil record should not be looked to as recording much more than the phylogeny of the Mactridae in this same region.

One might inquire how the distribution of the Mactridae reflects that of other marine organisms. Similar distributions may well be found in groups which parallel the family in their potential for dispersal, inhabitation of shallow water, and large representations in the American tropics and subtropics since the mid-Tertiary. Real difficulty may be encountered in understanding why some marine organisms living in the Central American area fail to have trans-Panamic distributional relationships.

Dr. Pilsbry: "Mactridae has an important bearing in determining the antiquity of various molluscan species, and in illustrating the rapidity of evolution. The Straits were closed during the Miocene, I understand. It is interesting to see how fast evolution progresses."

Mr. Chamberlin asserted under questioning that his conclusions had been drawn wholly from shell characteristics, though acknowledging the observation that in this family the soft parts may be studied as marks on the fossil shell.

## WIND ORIENTATION IN ACHATINA\*

J. L. CHAMBERLIN

(Abstract)

There are no reports of movements directionally oriented to wind (anemotaxis) by terrestrial animals in their natural environment. A few instances are reported from the laboratory. Numerous animals face the wind when at rest, but true anemotaxis has only been demonstrated in the flight of birds and a few insects.

During a ten-week field study (June 22 - September 7, 1951) on Tinian, Marianas Islands, the Island population of *Achatina fulica* Bowdich was observed to be migrating consistently eastward. Investigations of this phenomenon led to the conclusion that the snails were primarily orienting upwind (positive anemotaxis). Evidence for this conclusion was of several kinds.

The wind was observed to be easterly and the snails were moving eastward (NNE to SSE) on all but one night. On that night the wind was SSW and nearly all *Achatina* were crawling about SSW.

On one night forty individuals were placed on a smooth road surface and exposed to wind from an electric fan. They failed to reorient toward the fan, but crawled in essentially random directions. Simultaneously, forty controls moved upwind with a spread of 80°.

On another occasion, thirty snails were marked with reflecting tape and released together from a common starting point in a vegetated area. They were subsequently relocated with respect to the starting point, after periods of 24, 48, and 120 hours. Winds as recorded during this five-day period varied from NE to NNE. Single-day snail directions from the starting point varied in the smaller arc from NW to ESE. After 120 hours, the directions of the animals from the starting point varied from a few degrees west of N to a few degrees south of E.

On any night a very small fraction of the snails crossed the roads in a westerly (downwind) direction, giving some evidence of negative anemotaxis. When a group of west-crawling snails was transported to another location, nearly half still crossed the road downwind. After initially upwind-moving snails were translocated as controls, nearly 100% continued upwind. Negative anemotaxis is concluded to have been operating, but with less persistence than the positive.

One experiment may have demonstrated a mechanism which reversed anemotaxis from positive to negative. A group of snails were placed on a sectioned watermelon one evening. More gathered there during the night, totalling 139 on the melon at dawn. The movements of marked snails, that had been placed in the vicinity of the melon the previous evening, showed that most snails had moved upwind and these predominated on the melon. Shortly after dawn snails on the melon commenced to leave and hide for the day. But instead of moving away in an upwind direction, all observed (63) crawled downwind to hiding places. Snails not on the melon at dawn traveled upwind as usual to hiding places. It is suggested that the reason why the only snails that moved downwind in any numbers were those leaving the melon after dawn was that their anemotaxis was reversed by the stimulus of a superfluous food supply. *Achatina* could entirely consume long before dawn the meager quantities of food ordinarily encountered.

Topography, food, cover, and what is thought to have been visual orientation, modified the direction of anemotaxis. Although the image-forming ability of the species is unknown, visual stimulation alone seems to explain a behavior pattern observed during all experiments on the roads; namely, the directions taken by a group of snails did not have a central tendency necessarily directly upwind. Rather, it was more nearly at right angles to the road, although in the upwind direction. The junction of the white roads with darker vegetation is the suggested basis for such orientation.

More interesting than the anemotaxis itself is the unanswered problem of how this behavioral pattern relates to the species' economy. In the Marianas Islands, where winds are known to be easterly 86% of the year, the species could not maintain or have attained an island-wide distribution while showing continuous positive anemotaxis. Alternative hypotheses are: (1) the taxis fluctuates periodically from positive to negative for many individuals or for the entire population, (2) all anemotaxis is inhibited much of the year, allowing the return of some individuals to the west side of the Island (where a high reproductive potential could restock the population). The little evidence reported above suggests the former.

The period of field study was immediately following the annual dry season. Succulent ground cover was scarce. When any suitable food was encountered *Achatina* stopped until it was entirely consumed. Neither feeding snails nor such food as they ate were often observed. It may be that the period of field study was during a time of year when the migratory activity of *Achatina fulica* was strongly emphasized by a food shortage. Aestivating snails were common on arrival, but soon after no more were seen. The onset of the rainy season may have forced an end to aestivation before plant growth had produced an adequate food supply for the population.

The role of anemotaxis in the species' ecology in its East African homeland should be investigated toward a solution of the entire problem.

Mention was made from the floor of the extremely rapid reproductive cycle of *Achatina fulica*; at three months of age this obnoxious snail is capable

of parenthood! Some discussion ensued as to whether or not *A. fulica* is being over-rated as a potential danger to Hawaiian and perhaps to American agriculture, though it was pointed out that \$300,000 is being spent to keep this snail from becoming a serious menace to Hawaiian cane fields.

\*This investigation was performed under contract with the National Research Council, Pacific Science Board. The funds, as well as transportation to and from the area of study, and other facilities, were supplied by the Office of Naval Research.

## THE ECOLOGY AND DISTRIBUTION OF LYMNAEA (BULIMNEA) MEGASOMA IN MICHIGAN

HENRY VAN DER SCHALIE

(Abstract)

In 1948 some mastodon bones were found in a peat bog near Berrien Springs in southwestern Michigan. Among the shells which were taken at this site there was one specimen of *Lymnaea megasoma*. As early as 1908 the late Bryant Walker referred to this interesting Lymnaeid as a species with a decidedly boreal range in Michigan. In this recent excellent monograph, Bengt Hubendick, relying on records in the literature, indicated a more southern range for *L. megasoma*. As recent as 1935, John A. Thompson (see Goodrich, *Nutilus*, 54: 6-10, 1940) found a colony living in the Mahoning River at Alliance, Ohio. However, in spite of the evidence that *Lymnaea megasoma* was perhaps a common form in southern Michigan at a time contemporaneous with the Mastodon, its ecology and distribution at present is such that it must be considered a boreal form inhabiting only northern Michigan. Its habitat is generally in bayou-like situations adjoining lakes or rivers.

It was observed that there are two records of this species having been found in fossil form in southeastern California, and two more in Oklahoma. Dr. van der Schalie explained that he did not list the Lake Champlain record of Frank Collins Baker, since no late collection substantiates the record. He added that he should be most interested in seeing shells from there.

## OPPORTUNITIES IN MEDICAL MALACOLOGY

R. TUCKER ABBOTT  
United States National Museum

(Abstract)

In the last ten years there has been such an increase in interest and work in disease-carrying mollusks that it seemed appropriate that a paper be presented which reviewed these activities briefly and presented a compendium of the rather specialized field of Medical Malacology.

A brief history of the field was given in which it was pointed out that its birth came in 1882 when the German zoologist, R. Leuckart, discovered that the sheep liver fluke, *Fasciola*, passed its larval life cycle in the pond snail, *Lymnaea*. The greatest impetus to Medical Malacology came during World War II and the years that followed. Since 1942, over 100 papers have been published on parasitological research involving experiments with snails, and today in at least a dozen medical centers there are a score of research workers directly experimenting with mollusks.

Three additional aspects of Medical Malacology were outlined in some detail:

- (a) Functions and Services of a Medical Malacologist.
- (b) The Training of a Medical Malacologist.
- (c) Research Problems in Medical Malacology.

An expanded treatment of this subject will be published in either the Nautilus or some other appropriate medium.

## THE FAMILY CLAUSILIIDAE IN WEST AFRICA

JOSEPH C. BEQUAERT

Museum of Comparative Zoology

Dr. Bequaert comments upon the recent discovery of two specimens of Clausiliidae at Lolodorf, in the French Cameroon, West Africa. The shells are unfortunately so badly worn that it would be unwise to describe them. They are, however, not very closely related to any of the known genera and differ greatly from the few species recorded from eastern Africa. Attention is called to the present discontinuous distribution of the family in the Old as well as in the New World.

Dr. Bequaert suggested that at a future meeting, a paper be devoted to those parts of the world where collecting has not been done, or done too sparsely. Such a paper should perhaps be accompanied by a marked world map, and might serve to convince the young scientist that many fertile fields await his attention.

## USING SEA SHELLS AS OCCUPATIONAL THERAPY IN MENTAL HOSPITALS

MERRILL MOORE

Clinical Associate in Psychiatry, Harvard Medical School

This paper was a follow-up on an earlier paper in which the idea was first suggested that sea shells be used as material for occupational therapy in mental hospitals overseas during World War II. It concluded with some general ideas which could be of use for anyone interested in the general field of occupational therapy, with particular reference to the use of sea shells and other marine biological material.

Dr. Moore stressed the need of even the simplest of material, and suggested that anyone possessing duplicate shells will help immeasurably by sending them to the mental hospitals in their own states.

## THE WILLIAM F. CLAPP LABORATORIES

RUTH D. TURNER

Museum of Comparative Zoology

Miss Turner spoke briefly on the origin and function of the William F. Clapp Laboratories at Duxbury, Mass., to be the scene of the field trip of the following day. Illustrating with Kodachrome slides, she outlined the history of this unique organization from its humble beginning in an old barn thru many transitions, to its present status. Now the organization occupies as well a second building, which in turn is beginning to strain at the seams. Miss Turner had been an assistant of the late Dr. Clapp so it was especially fitting that she describe the work which he began, and which will not be finished so long as men sail the seas.

As she concluded, the comment was made that each year International Nickle Co. sponsors a conference on corrosion. Last year the company voted to furnish a William F. Clapp award for an outstanding contribution in that field.

With the conclusion of Miss Turner's remarks, Mr. Clench, after making routine announcements, voiced his and Miss Turner's thanks for such good attendance, and seconded the invitation of Dr. Romer, given at the beginning of the meeting: "Come again, any time!"

Following a brief hour during which time delegates repaired the ravages of the day, they once again assembled in the Commander's Mount Vernon room, this time as guests of Dr. Jeanne S. and General Frank R. Schwengel for another of their famous cocktail parties.

Following the social hour, a buffet supper was served, and once again the Schwengels had added the touch which makes these annual meetings such completely enjoyable affairs.

Last on the list of scheduled events was the field trip, though far from least in order of importance. Nearly fifty people made the thirty-five mile trip to Duxbury, and again careful planning paid off. Mr. Herbert Athearn was in charge of transportation, and so arranged matters that the excursion was made entirely in private cars, with space to spare.

Arriving pretty much en masse at the Clapp Laboratories, the crowd was taken in groups on tours of the experimental laboratory, the museum, and most important of all, the research laboratory. To this latter place comes an endless series of "test panels" from every part of the globe. Unimpressive they are in appearance, yet they are tremendously important, for they have been immersed in waters known to have been (or perhaps merely suspected to be) infected with that rogue of the molluscan world, the shipworm. He comes in many guises, bearing many names — yet be he called "Bankia," "Teredo," or any of his other titles, he is hated and feared and fought. And since the mightiest weapon is knowledge, it is here in this remodeled barn that the greatest war is waged. Trained eyes read the message in the riddled pieces of board, and recommendations go out from this place to be acted upon in the furtherest outpost. For he is a common enemy, the shipworm, and men may fight one another, yet join forces to war against this inconspicuous little mollusk who asks but to be let alone to live out his time under the sea in a dark, dank piling!

Hurried collecting along the shore — the tide was coming in — then picnic lunches were spread upon the lawn, and the sun which up to that time had been very coy, shone down to prove that he, too, loves malacologists.

The staff of the laboratories had been most patient as they guided, explained, answered dozens of questions. The welcome of Mrs. Dorothy Brown, Mr. Hap Pearson, and Mrs. Robert Bernash of the Staff had been so sincere, and Mrs. William F. Clapp, the sort of person whom you've always known, was so cordial that one hated to leave. In fact, few did leave before enjoying a boat ride about the harbour. But plans had been made, so groups went in different directions according to inclination; some made a quick trip to the marine biological station at Woods Hole, Mass. Another party elected to collect freshwater mussels at Half Way Pond, near Plymouth, and still another chose to beach-comb at Duxbury Beach. It is rumored that this trio lunched on fried clams and chocolate ice cream later in the day, proving malacologists to be a hardy lot indeed.

Thus was concluded the eighteenth annual meeting of the American Malacological Union, one of the most successful, surely the best attended. But that record will soon fall, for interest in malacology is growing rapidly, and great days are ahead!

MARGARET C. TESKEY, *Secretary*

## **REGISTRATION, EIGHTEENTH ANNUAL MEETING**

R. Tucker Abbott, Washington, D. C.  
Dr. Emile Abdel-Malek, Cairo, Egypt  
Mr. and Mrs. Harold J. Allgaier, Cambridge, Mass.  
Sergio Arias, Caracas, Venezuela  
Mrs. Norma L. Ashberry, Buffalo, N. Y.  
Mrs. Eleanor W. Athearn, Fall River, Mass.  
Mr. and Mrs. Herbert D. Athearn, Taunton, Mass.  
Dr. and Mrs. H. B. Baker, Philadelphia  
Prof. and Mrs. F. N. Balch, Jamaica Plain, Mass.  
Dr. Joseph C. Bequaert, Cambridge, Mass.  
Mr. and Mrs. Alger P. Blaine, Springfield, Mass.  
Edwin J. Carswell, Sunnyside, Long Island, N. Y.  
Mr. and Mrs. J. Lockwood Chamberlin, Cambridge, Mass.  
Dr. Merrill E. Champion, Rockport, Mass.  
Dr. and Mrs. Austin W. Cheever, Boston, Mass.  
Mr. and Mrs. Arthur H. Clark, Jr., Watertown, Mass.  
Mr. and Mrs. William J. Clench, Cambridge, Mass.  
Miss Ruth E. Coats, Carlsbad, California  
Mr. and Mrs. Reid Cook, Toronto, Ontario, Canada  
Mr. James A. and Mrs. Mary Cumming, Grand Island, N. Y.  
Mr. and Mrs. Otis H. Dana, Rockport, Mass.  
Murray Darling, East Freetown, Mass.  
Anthony D'Attilio, Valley Stream, N. Y.  
Carl W. Erickson, Worcester, Mass.  
Miss Margaret F. Farrell, Brookline, Mass.  
Dr. and Mrs. Robert C. Flipse, Key Biscayne, Florida  
Richard W. Foster, Cambridge, Mass.  
Mr. and Mrs. Frank K. Hadley, West Newton, Mass.  
Mr. and Mrs. E. O. Houghton, Toronto, Ontario, Canada  
Mr. and Mrs. Ralph W. Jackson, Cambridge, Md.  
Morris K. Jacobson, Rockaway Beach, N. Y.  
Ronald A. Kropf, Pittsburgh, Pa.  
Mr. and Mrs. Clinton V. MacCoy, Norwell, Mass.  
Gordon K. MacMillan, Pittsburgh, Pa.  
Mr. and Mrs. Chester W. Melville, Chestnut Hill, Mass.  
Mr. and Mrs. Edward H. Michelson, Cambridge, Mass.  
Comdr. and Mrs. Alexander G. Moberg, E. Freetown, Mass.  
Dr. Merrill Moore, Boston, Mass.  
Dr. George M. Moore, Durham, New Hampshire  
Dr. and Mrs. Juan J. Parodiz, Pittsburgh, Pa.  
Dr. Henry A. Pilsbry, Philadelphia, Pa.  
Thomas E. Pulley, Houston, Texas  
Murray E. Reed, Syracuse, N. Y.  
Dr. Harald A. Rehder, Washington, D. C.  
Eugene H. Schmeck, Niagara Falls, N. Y.  
Dr. Jeanne S. Schwengel, Scarsdale, N. Y.  
Mrs. Nellie C. Strong, Somerville, Mass.  
Dwight, W. Taylor, Altadena, California  
Mrs. Margaret M. Teare, Buffalo, N. Y.  
Mrs. Margaret C. Teskey, Buffalo, N. Y.  
Mr. and Mrs. Fred Tobleman, Newark, N. J.

Miss Ruth D. Turner, Cambridge, Mass.  
Dr. Henry van der Schalie, Ann Arbor, Mich.  
Mr. and Mrs. Gilbert Voss, Coral Gables, Florida  
Miss Germaine L. Warmke, Mayaguez, Puerto Rico  
Miss Gertrude M. Weber, Buffalo, N. Y.  
Heathcote M. Woolsey, Kent, Conn.

## NOTICE!

Membership dues in the A.M.U. have not been increased nor will they be as long as current expenses (printing, postage, etc.) can be met by the modest fee of one dollar per year.

However, corners must be cut, and as an economy measure one copy of the yearly report bulletin is being sent to husband-and-wife memberships instead of the usual two.

If for any reason a second copy is desired, please notify the secretary and it will be mailed without delay.

**CLINICAL SONNETS, (1949); ILLEGITIMATE SONNETS, (1950);  
and CASE RECORD FROM A SONNETORIUM, (1951)**

Twayne Publishers, Inc., New York City

These three volumes of recent poems come from the pen of a poet-psychiatrist who is also an ardent shell collector and enthusiast. In his fifty years of living, including twenty-five years of medical practice, Doctor Moore has learned a great deal about people and mollusks and compares them to each other. He feels that the outside personality of a human being is like a shell whereas the inner true personality is like the living mollusk within the shell.

Doctor Moore is now working on a new book to be titled **MORE CLINICAL SONNETS** which will be published early in 1953.

He has actively supported the American Malacological Union and has many friends in its membership.

If one is interested in poetry these poems are well worth reading.

The noise that Time makes in passing by  
Is very slight but even you can hear it,  
Having not necessarily to be near it,  
Needing only the slightest will to try:  
Hold the receiver of a telephone  
To your ear when no one is talking on the line  
And what may at first sound to you like the whine  
Of wind over distant wires is Time's own  
Garments brushing against a windy cloud.  
That same noise again but not so well  
May be heard by taking a small cockle-shell  
From the sand and holding it against your head;  
Then you can hear Time's footsteps as they pass  
Over the earth brushing the eternal grass.

From "CASE-RECORD FROM A SONNETORIUM  
By Dr. Merrill Moore

## NEWS AND NOTICES

Several A.M.U. members are engaged in or have completed work which has taken them out of the country for varying periods of time. Dr. and Mrs. Elmer G. Berry returned to Washington in August from a two-year stay in West Africa where Dr. Berry was engaged in work dealing with the intermediate snail hosts of human schistosomiasis. His survey was carried out under the auspices of the Mutual Security Administration.

Dr. Joseph P. E. Morrison of the United States National Museum spent three months last summer on Raroia Atoll in the Tuamotu Islands, French Oceania, where he was the general zoologist for the 1952 Pacific Science Board Expedition working on ecological surveys of coral atolls. While on Raroia, he greatly enjoyed a brief visit from Dr. Gilbert Ranson of the National Museum of Natural History of Paris. Dr. Ranson was studying the pearl oyster fisheries of French Oceania, as well as collecting all kinds of mollusks in sight — as was Dr. Morrison. On his way home, Dr. Morrison gave a lecture before the Hawaiian Malacological Society on the subject of atoll mollusks.

In November, Dr. and Mrs. Henry van der Schalie and their children left Ann Arbor, Michigan, for Cairo, Egypt, where they expect to spend about a year. Working under the World Health Organization of the United Nations, Dr. van der Schalie is to be senior advisor to the Egyptian Government in a *Bilharzia* snail-control program.

Although the date has not as yet been determined, the 1953 annual meeting will be held at the University of Kansas, Lawrence, Kansas. Detailed notices will be sent out when arrangements are completed. Plan to attend!

Mrs. Imogene C. Robertson wishes to express her deep gratitude for the honorary life membership bestowed upon her at the 1952 convention, and she recalls with heartfelt appreciation the previous honors and gifts of which she has been the recipient. Her many friends may be assured that although confined to her home by illness for the past several months, "Genie" retains her cheery disposition, and her keen interest in the A.M.U. remains unabated.

From the Philadelphia Evening Bulletin, December 8th, 1952: "Soon after U.S. occupying troops reached Japan in 1945 the headquarters of General MacArthur received a brief—if bewildering—query from Emperor Hirohito. By chance did anyone know if Dr. Henry Augustus Pilsbry was still alive, the emperor asked.

The Army, after a flurry of cables, reported that Pilsbry was alive and still active as curator of mollusks at the Academy of Natural Sciences in Philadelphia.

Hirohito, who wrote a book on Japanese marine shells before the war and is rated a "good mollusk man" by scientists today, was so delighted he dispatched a copy of his book to Dr. Pilsbry.

The emperor—and naturalists of all countries—will be equally delighted to learn that Dr. Pilsbry's 90th birthday came up today and he is observing it at work in his cluttered office. Furthermore, he has no thought of quitting the position he has held for 64 years. "I've got 10 or 15 years' work stacked up in front of me now," said he.

## OUR MEMBER CLUBS

### NORTHERN CALIFORNIA MALACOZOOLOGICAL CLUB

LUCILLE ZELLERS, Secretary

The Northern California Malacozoological Club was organized in February 1952 with 12 charter members. Officers were elected as follows: Ralph O. Fox, president; Helen Burton, vice-president; Lucille Zellers, secretary-treasurer. Meetings are held the first Tuesday of each month at the Oakland Museum. A membership of 44 members includes scientists as well as amateurs with varied interests in shells and marine life in general.

Allyn G. Smith lectured on the bird, animal and marine life on the Farallone Islands. Slides were also shown and an exhibit of marine specimens found on the islands were displayed. A symposium was conducted by Ralph O. Fox on methods and equipment used in collecting. Dr. Rudolf Stohler spoke on preservation of specimens and the use of plastics in preservation. Allyn G. Smith told of the equipment and methods used in dredging. Dr. William Hartman lectured and exhibited various species of sponges and told where they may be found. Harry Fritchman spoke on and illustrated with kodachrome slides the California Limpets. William K. Emerson showed slides of the Hawaiian gastropods and acted as narrator. William K. Emerson and Ralph Fox told of their collecting trip to Lower California before attending the A.M.U.P. convention in Los Angeles. (Allyn G. Smith was elected president and Ralph O. Fox secretary-treasurer of the A.M.U.P. for 1952-53.) An exchange of shells and identification of same featured the program of one of the meetings. Helen Burton told of her collecting trip in Mexico with Colonel and Mrs. Lee Miles.

The main project of the club is to establish a library and collection of West Coast mollusks in the Marine Room of the Oakland Museum. A Junior club to be established in the near future. Field trips and viewing other members collections are also in the plans for the future.

### BOSTON MALACOLOGICAL CLUB

Miss MARGARET FARRELL, Secretary

The 1951-1952 season of the Boston Malacological Club was very successful. Meetings were held on the first Tuesday of each month October through May at the Massachusetts Audubon Society Library, 155 Newbury St., Boston, at 8 P.M.

SPEAKER	SUBJECT
October 1951	Summer Activities of Members
November 1951 Mr. Thomas Pulley	Shell Collecting in the Gulf of Mexico
December 1951 Mr. Paul Holly	Flora and Fauna of Bermuda
January 1952 Movie	"Rendezvous in a Reef" provided by the Esso Company
February 1952 Mr. Richard W. Foster	A Trip to Tobago
March 1952 Mr. J. Lockwood Chamberlain	A Trip to the Western Pacific to Study the Life History of the Giant African Snail
April 1952	General Discussion with members bringing in interesting or unusual specimens or books connected with malacology.
May 1952 Mr. Edward Michelson	Fresh Water Shells in the Great African Lakes

The Club went to Half Way Pond, Plymouth Township, Mass. for their Annual Outing on Sunday, June 15, 1952. It was the largest and most successful of the recent outings with everyone enjoying the abundant fresh water collecting.

1951-1952 and 1952-1953

<i>President.....</i>	Dr. Austin W. Cheever
<i>Vice-President.....</i>	Mr. Herbert Athearn
<i>Secretary-Treasurer.....</i>	Miss Margaret Farrell
<i>Conchological Recorder.....</i>	Dr. Joseph C. Bequaert
<i>Executive Committee.....</i>	Mrs. F. K. Hadley, Mr. Arthur Clark

**THE CONCHOLOGICAL SECTION  
BUFFALO SOCIETY OF NATURAL SCIENCES  
MARGARET C. TESKEY, Secretary**

The 1951-52 schedule of the club has been a full one. Meetings were held once each month, at the Buffalo Museum of Science during the fall, winter and spring, and at the homes of members during the summer when museum facilities were not available.

The big event of 1951 was the annual meeting of the American Malacological Union which was held in Buffalo, at which time the Section served with the Buffalo Museum of Science as co-hosts. Thorough planning paid off when the three-day convention progressed without a hitch, and later one full meeting of the Section was devoted to a review of the successful affair.

That meeting was a picnic, held on the spacious lawns at the home of president Imogene C. Robertson. On another occasion the meeting took the form of a "Dredging Party," and a rich haul was made as members picked out minute and sometimes rare specimens from dredged material donated by the McGinty brothers of Boynton Beach, Florida. And at the annual business meeting in January the group enjoyed a banquet at a local restaurant and re-elected the following panel of officers: President, Imogene C. Robertson; Vice-President, Margaret M. Teare; Treasurer, Annie C. Hoffman; Secretary, Margaret C. Teskey.

Three new members have been enrolled during the current year, and a full schedule is being drafted for the months ahead.

**PACIFIC SHELL CLUB  
DR. HOWARD R. HILL**

Meetings are held on the third Sunday afternoon of each month, from October to May inclusive, at the Los Angeles County Museum. There are 65 members—50% of whom are children. Attendance at meetings averaged 40. Membership dues are 50 cents per annum.

Programs consisted of special displays of shells and talks by club members or invited guest speakers. A feature of the programs popular with members is the distribution of shells and drawings for especially fine specimens, which have been donated for such purpose by individuals or institutions. In this manner beginners have been helped in the building-up of their collections.

The officers for 1951-52 were: Glen Russell, President; Agnes Shumate, Secretary; Lloyd E. Berry, Treasurer. The sponsor of the club is Dr. Howard R. Hill, Curator of Marine Zoology, Los Angeles County Museum. The officers for 1952-53 are the same with the exception of President-elect Arnold Johnson.

(Photo by Ufford)

DELEGATES TO EIGHTEENTH ANNUAL MEETING OF THE  
AMERICAN MALACOLOGICAL UNION

First Row, Left to Right: Herbert Athearn, Mrs. Norma Ashbery, Mrs. Roy Athearn, Mrs. Alexander Moberg, William Clench, Heathcote Woolsey.

Second Row: F. K. Hadley, Murray Darling, Dr. Henry Pilsbry, Ruth Turner.

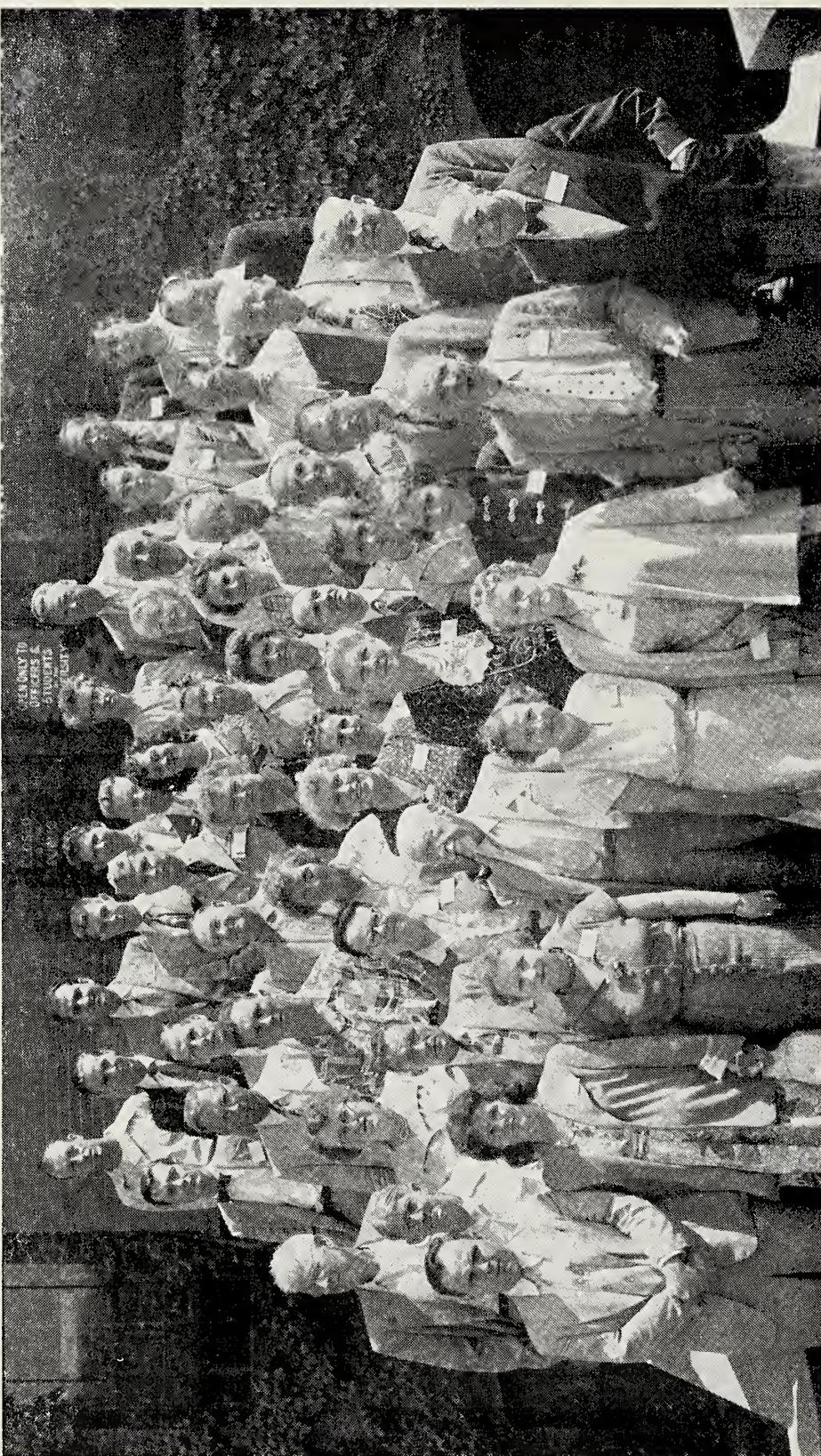
Third Row: Dr. H. B. Baker, Ruth Coats, Dr. Jeanne Schwengel, Gertrude Weber, Mrs. Nellie Strong, Germaine Warmke, Richard Foster, Dr. Joseph Bequaert.

Fourth Row: James Cumming, Mrs. Mary Cumming, Mrs. Juan Parodiz, Dr. Juan Parodiz, Morris Jacobson, Murray Reed.

Fifth Row: Dr. George Moore, Alger Blaine, Mrs. A. Blaine, Mrs. F. K. Hadley, Mrs. H. B. Baker, Mrs. Fred Tobleman, Ralph Jackson, Anthony D'Attilio, Gordon MacMillan.

Sixth Row: R. Tucker Abbott, Dr. Harald Rehder, Dr. Robert Flipse, Dr. Henry van der Schalie, Mrs. R. Flipse, Mrs. Margaret Teare, Fred Tobleman, Sergio Arias, Ronald Kropf.

Back Row: Arthur Merrill, Edwin Carswell, Dr. Emile Abdel-Malek, Dwight Taylor, Edward Michelson, Mrs.



(Photo by Weaver)

DELEGATES TO THE 1952 MEETING OF THE  
AMERICAN MALACOLOGICAL UNION, PACIFIC DIVISION

First Row, Left to Right: R. G. Beck, Ralph O. Fox, Miss Ruth M. Coats, Mrs. Elsie M. Chace, Dr. W. O. Gregg, Allyn G. Smith, Mrs. Ora Willett, Mrs. Helmut Meier, Miss Harriet Thomson.

Second Row: Mrs. R. G. Beck, John Q. Burch, R. L. Morrison, Dr. A. D. Howard, Dr. Albert R. Mead, Dr. S. S. Berry, E. P. Chace, Mrs. Hazel Whelchel, Mrs. Emily W. Coats.

Third Row: Joel Allbee, Martin McGaughey, W. K. Emerson, Ernest Wilcox, John Fitch, Mrs. John Q. Burch, Miss Agnes Shumate, Mrs. Ruth C. Whitney, Miss Myrtle Sprague, Mrs. Harry Turver, Helmut Meier.

Back Row: Arthur Price, Mrs. N. Matzen, Miss Ruth E. Eaton, Merton Hinshaw, Ralph Bormann, Mrs. Ralph Harry Turner



## THE CONNECTICUT SHELL CLUB

MRS. GERTRUDE THOMPSON, Secretary

We meet on the second Friday of every month in the Peabody Museum on the Yale Campus. Some of our meetings feature guest speakers, at others movies are shown, and we recently enjoyed a "Swap Night" which brought out some good shells for inspection and exchange.

Another club activity is the purchase of reference books on shells as money becomes available, and in this matter we have the excellent advice of our club president, Mr. Percy Morris, who has himself authored two shell books.

With a membership of 42 we look forward to good meetings and good shelling during the months to come.

Officers of the Connecticut Shell Club are: President, Mr. Percy Morris; Vice-President, Mrs. Francis Bissell; Treasurer, Mr. William Tuthill; Secretary, Mrs. Gertrude Thompson.

## NEW YORK SHELL CLUB

MORRIS K. JACOBSON, President

Rounding out the fourth year of its existence, the New York Shell Club is continuing its steady growth. We now have more than 60 members, and our meetings attract between 35 and 50 members and guests to every session. Our largest meeting of the past season was that at which Mr. R. Tucker Abbott of the United States National Museum was good enough to favor us with an attractive film and a fascinating illustrated talk. In a sense, this meeting was a sort of culmination. During the year we heard numerous talks by members on varied topics, from an analysis of the genus *Latiaxis* by Mr. Anthony D'Attilio, to discussions of the life and works of such figures as Dr. Dall (by Roget Bretet) and General Joseph G. Totten (by Dr. Walter H. Jacobs.) Faunistically our activities were highlighted by first records of several species never before reported from the New York area. The most noteworthy find was that of *Discus rotundatus* (Müller), which has now turned up in four separate localities. Another newcomer is *Oxycilus draparnaldi* (Beck) which is turning up practically everywhere one looks. *Turtonia minuta* (Fabricius) is new to our fauna and its discovery in Rockaway Beach represents a southward extension of range. Another important record is the confirming of the presence of *Dreissena (Mytilopsis) leucophaeata* (Conrad) at Haverstraw, New York, where it was originally reported by Dr. Rehder some years ago. On our field trip on May 10, 1952, we made a first record of *Ventridens ligera* form *stonei* Pilsbry, at New Springville, Staten Island. Those most active in the study of our local mollusks were Eddy Slater, Roget Bretet, Sam Freed, Edwin Carswell, Michael Krassner, Karl Jacobson and Anthony D'Attilio, although we are proud to note that practically all our members are now vigilantly watching for "newcomers." We were regretfully forced to bid a fond farewell to our member Roget Bretet, who returned to France, from whence however he sends us frequent and very welcome greetings in the form of fine boxes of shells from St. Jean Cap Ferrat in southern France. Our members Selma Geffner and Harold Feinberg were married, and both are now overseas in Germany in military capacities. Ed Karlin is studying in Minnesota and does not let us forget him. We see no reason for not looking forward to the new year with confidence and hope. Our officers are: President, Mr. Morris K. Jacobson; Vice-President and Treasurer, Mr. Anthony D'Attilio; Secretary, Dr. Walter H. Jacobs; Corresponding Secretary, Mrs. Dorothy D. Freas.

**THE AMERICAN MALACOLOGICAL UNION  
EXECUTIVE COUNCIL  
1952-1953**



**Officers**

President.....	DR. A. BYRON LEONARD
Vice-President.....	DR. JOSEPH C. BEQUAERT
Second Vice-President.....	(Chairman, A.M.U.P.) MR. ALLYN G. SMITH
Treasurer-Secretary.....	MRS. MARGARET C. TESKEY



**Councillors-at-Large**

MR. R. TUCKER ABBOTT	DR. CARLOS G. AGUAYO
MISS RUTH E. COATS	MISS RUTH M. TURNER



Past Presidents remaining on the Council without reelection: Dr. Henry A. Pilsbry (1931-1932); Dr. Paul Bartsch (1933); Prof. Junius Henderson (1934)\*; William J. Clench (1935); Calvin Goodrich (1936); Dr. Joshua L. Baily, Jr. (1937); Dr. Carlos de la Torre (1938)\*; Maxwell Smith (1939); Dr. Horace B. Baker (1940); Dr. Harald A. Rehder (1941); Frank Collins Baker (1942)\*; Dr. Louise M. Perry (1943); Dr. Henry van der Schalie (1944-1947); Dr. A. Myra Keen (1948); Dr. Elmer G. Berry (1949); Dr. Fritz Haas (1950); Dr. J. P. E. Morrison (1951); Dr. Jeanne S. Schwengel (1952).

Honorary Presidents: Mrs. Ida S. Oldroyd (1934-1940)\*; Dr. Henry A. Pilsbry (1936-); Mrs. Imogene C. Robertson (1939-).

\*Deceased.



**PACIFIC DIVISION**

**Officers**

Chairman.....	MR. ALLYN G. SMITH
Vice-Chairman.....	MRS. ELSIE M. CHACE
Secretary-Treasurer.....	MR. RALPH O. FOX

# THE AMERICAN MALACOLOGICAL UNION

## CONSTITUTION ADOPTED 1931

1. This society shall be called "The American Malacological Union."
2. Its object shall be the promotion of the science of malacology by holding meetings for reading and discussion of papers, and for furthering the interests of students and collectors of shells by facilitating acquaintance and co-operation among the members.
3. Membership shall be limited to persons resident in the Americas and Hawaii. New members may be proposed by two members and balloted for by the Council. They shall pay an annual subscription (dues) of \$1.00. They will receive without other charge all notices, programs, lists of members, etc., issued by the Union.

NOTE: In practice the Council ballots have been delegated to the Secretary.

4. The following officers shall be elected annually by ballot: President, Vice-President, two Secretaries and Treasurer.
5. The Union will be governed by a council consisting of the officers and four other members to be elected annually by ballot.
6. The annual meeting shall be held at such time and place as may be fixed by the preceding annual meeting. Other meetings may be called by the Council. Meetings of local branches may be held as such branches may determine.
7. Proposals for the alteration of this constitution when signed by five members and passed by the Council shall be acted upon at the next annual meeting. Concurrence of three-fourths of the ballots cast is necessary for any alteration.
8. The "NAUTILUS" is hereby designated as the official organ of the Union. (Zoological Laboratory, University of Pennsylvania, 38th and Woodland Ave., Philadelphia 4, Pa.)

## RESOLUTIONS

That there be an honorary membership for such as have contributed in an outstanding way to American conchology.— Adopted May 26, 1932. (The late Charles Torrey Simpson, Bryant Walker, Victor Sterki, and Thomas Barbour were honorary members).

That there be a corresponding membership for those not resident in the Americas.— Adopted May 26, 1932.

That the Council shall consist of the officers, honorary and past presidents, and members at large not to exceed four. Members of the Council present at any annual meeting shall constitute a quorum.— Adopted August 3, 1937.

That the Chairman of the Pacific Coast Branch be a Second Vice-President.— Adopted August 26, 1948.

That life membership may be purchased for the sum of twenty-five dollars.— Adopted August 20, 1952.

# **AMERICAN MALACOLOGICAL UNION — PACIFIC DIVISION**

## **MINUTES OF THE FIFTH ANNUAL MEETING**

Los Angeles, California  
JUNE 20, 21 and 22, 1952

Shortly after noon on June 20th the members of the Pacific Division of the American Malacological Union began gathering in Founders Hall, University of Southern California, for registration, and at 1:15 P.M. Chairman W. O. Gregg called the meeting to order.

We were officially welcomed by Dr. Irene McCulloch, and Dr. Gregg made a brief response. Chairman Gregg then appointed a committee, consisting of Mr. Andrew Sorenson, Miss Ruth M. Coats and Mr. John Q. Burch to prepare a list of officers for consideration at the business session, and presented the various committee heads.

Miss Ruth Coats, program chairman, then introduced the first paper of the meeting, prepared by our senior member, Mr. Andrew Sorenson, and read by his daughter, Mrs. A. T. Whelchel. Mr. Sorenson had taken as his subject, "The Importance of the Amateur," and comparing the amateur to army privates and the professionals to officers, he reminded us that both are necessary and must co-operate.

The next paper by Dr. Albert Mead dealt with foreign mollusks in Arizona and New Mexico. Its main points will be found in the abstract which appears on another page.

John Burch then read a paper sent in by Mr. Walter J. Eyerdam, who was unable to be present, having left for Alaska shortly before the meeting date. He suggested the introduction of various kinds of birds and large "monitor" lizards into the Hawaiian Islands to control the Giant African Snail, *Achatina fulica*. A lively discussion followed, with various speakers recalling other "control" introductions where the cure had proved worse than the disease.

Mr. E. P. Chace spoke briefly on "Some Problems in West Coast Pholads." In attempting to pin down the numerous names which have been used in our West Coast Pholads he had supplemented many of the brief original descriptions; but in view of the work which Miss Ruth D. Turner expects to publish shortly, no abstract was made.

Dr. A. M. Keen then spoke on "West American Tertiary Molluscan Fauna." As usual her paper was both informative and interesting.

Dr. Arthur Howard of Hancock Foundation was the last speaker of the afternoon, discussing a little known group: "Some Pteropods of the Eastern Pacific." An abstract of his paper appears on another page but necessarily lacks the lantern slides which those present found of great help toward understanding these tiny creatures.

The Friday evening meeting began with an informal talk by Dr. S. S. Berry, entitled, "Memories of the Older Malacologists." Many names in books became real and friendly people as Dr. Berry spoke.

After a brief intermission Dr. Mead showed movies, mostly in color, of "Natives and Their Surroundings in the Gold Coast and Nigeria, Africa." These pictures taken in connection with Dr. Mead's work on the Giant African Snail, and frequently under difficulties, were much enjoyed.

The Saturday sessions began at 9:30 A.M. with a short business meeting. The nominating committee suggested that Mr. Allyn Smith be advanced from Vice-Chairman to Chairman, Mrs. Elsie M. Chace from Secretary-Treasurer

to Vice-Chairman, and nominated Mr. Ralph Fox of Berkeley for Secretary-Treasurer. The report being accepted in due form, the nominees were unanimously elected.

At this time the group was reminded that our Councillors-at-large were Dr. A. Myra Keen, Miss Ruth M. Coats, Mr. John Q. Burch and Dr. Leo G. Hertlein, with Dr. Wendell O. Gregg replacing Dr. Keen at the close of this gathering.

A letter from Dr. Jeanne Schwengel was read regretting her inability to be with us, and asking that some of our papers be sent to be read at the meeting at Cambridge.

Miss Coats proposed that this group write a letter expressing the hope that Dr. Katherine Van Winkle Palmer's monograph on Carpenter's types could be published on the West Coast. The California Academy of Sciences and the San Diego Society of Natural History were mentioned as suitable places.

The first paper of the day was given by Mr. Ralph Fox, an account of the organization of the new Malaco-zoological Club in Berkeley. An abstract of this paper appears elsewhere. The chairman expressed best wishes to the young organization.

The next speaker, Mr. Roy L. Morrison, took as his topic, "Environmental Change on Molluscan Life in Mission Bay, San Diego." He presented two surveys, one made about 1929, and the other this year (1952). Much of Mr. Morrison's talk is being published in the "Minutes of the Conchological Club of Southern California," but a brief resumé is given with the other papers of this meeting.

The afternoon session began with a talk by Mr. Merton Hinshaw of Pacific Grove Museum, a running commentary with beautiful lantern slides illustrating "Some Molluscan Habitats of the Monterey Peninsula."

Mr. John Fitch, of the California State Fisheries Laboratory, discussed "Management Problems of a Molluscan Sport Fishery." Mr. Fitch very kindly furnished an abstract of his talk; but it seems desirable to repeat here that the authorities are not anxious to close areas and fisheries; or to keep them closed, but rather to have them open as much as is possible and have them permanent.

Mr. H. A. Edwards of the Southwest Museum gave us an artist's analysis of "The Evolution of Color Patterns in the Shells of the Genus *Conus*." There is no abstract of this paper as it would be difficult to make Mr. Edward's ideas clear without the fine charts which he had made.

Mr. Helmut Meier displayed a collection of very lifelike models of several Southern California molluscs. His work was much enjoyed and where available is very helpful in answering, "What does it look like?"

The final paper of the afternoon meeting was a scholarly one by Dr. Berry on "The Production of Light by Mollusca." Those present were treated to a clear and logical discussion of a most intricate and puzzling subject.

The Sunday morning meeting began with a short business meeting, at which the Treasurer's report, showing about \$48.00 on hand (no bills having yet been presented) was read and approved. Two copies of the group photographs were ordered, one for the Pacific Division's own scrap book and the other for the one prepared by Mrs. Teskey. The Secretary was instructed to write the proper letters of thanks for various courtesies, including the badges furnished by the Los Angeles Chamber of Commerce.

Business being disposed of, the group next heard Mr. Wm. Emerson's paper on "The Influence of Upwelling on the Distribution of Marine Floras

and Faunas of the Pacific Coast off Baja, California." Don't miss this abstract for here is the explanation of some of our "discontinuous distribution" puzzles.

Mrs. Ruth Whitney of Los Gatos presented an interesting talk on a review of South African Patellidae by Koch—a group as fascinating, and perhaps as puzzling, as our own Acmaeidae.

In lighter vein was the paper which Dr. Joshua Baily, Jr. (being then in England) had sent to be read. This is an account of an episode some 200 years ago in which palaeontology and theology were mixed with interesting results.

Mrs. John Q. Burch gave a short talk on Dr. Wm. M. Ingram's "Review of the Living Cypraeas of the Western Hemisphere" which she illustrated with lantern slides and some beautiful specimens.

Mr. David Baker of San Diego discussed briefly the opinions which he, working alone, had formed on the puzzle of *Murex petri* Dall. His talk proved a spring-board for one of the liveliest discussions of the meeting.

Dr. Mead then gave a report which appears elsewhere (in abstract) on "The Status Quo of the Problem of the Giant African Snail."

The final paper of the meeting was given by our Chairman-elect, Mr. Allyn Smith, on "Shells of California Caves." As some of the names used have not yet been published, no abstract of his paper was turned in, but it may be said that he told of five genera, six species, and an additional sub-species found in or around various California caves from as far west as the San Francisco Bay area, east to Amador County, as far north as Shasta County, south to Tulare County. His talk was much enjoyed and we are looking forward to its publication.

According to our custom, the Annual Banquet was held on Saturday evening. This year we met at The Old Dixie Dining Room under arrangements made by our capable banquet chairman, Mrs. Rose Burch. Varied packets of shells served as favors and place cards decorated with shells, seaweed and garnet sand had been made by Mrs. Burch and Mr. and Mrs. H. Arden Edwards with Mr. Edwards wielding a skillful paint brush. There were no speeches, but after dinner the group enjoyed a contribution from the Waikiki Aquarium, Bishop Museum, and Committee on Natural Sciences for Youth of the Outdoor Circle, all of Honolulu. This consisted of charming lantern slides of Hawaiian Gastropods by Mr. Spencer Tinker and a recorded commentary by E. H. Bryan, Jr.

The Convention was enjoyed by all present and particular thanks were expressed to Dr. Irene McCulloch of the Allan Hancock Foundation for her assistance in arranging for the meeting-place, to Mrs. Burch for varied activities in preparations, and last but not least to Miss Ruth Coats, who not only served as program chairman, arranged for and introduced the different papers, but loaned and operated by her own tape-recorder and the lantern which illustrated many of the papers.

ELsie M. CHACE, Secretary, A.M.U.P.

## SOLOMON ISLAND MEGAPODES RECOMMENDED AS DESTROYERS OF AFRICAN SNAIL PESTS

WALTER J. EYERDAM

(Abstract)

I have been impressed in noting the useful research work done by Dr. Yoshio Kondo at the Bishop Museum in Honolulu on the problem of controlling the terrible African snail pest *Achatina fulica* in the South Pacific.

In my opinion arsenic stones and arsenic sprays can hardly be applied with success over large areas for fear of its dangerous toxic effect on humans and on useful animals.

The large *Varamus* or Monitor Lizard is a voracious feeder on *Achatina* of various species and its jaws and dentition are so constructed to special adaptation in holding and crushing these large snails. The great danger of introducing these lizards into the infected islands is that they might become a fearful pest, feeding on poultry, etc.

In my opinion, the most promising agent for the control of the African snail pest and at the same time a very desirable economic asset to any community is the Solomon Island bush hen or Megapode, whose scientific name is *Megapodius erimita* or *Megapodius brenchleyi*. It feeds largely on snails, bugs, scorpions, centipedes and harmful insects and worms.

As a member of the Whitney South Sea Expedition in the Solomon Islands, I often shot and skinned bush hens. I usually examined the stomach contents which were mostly crammed with snail shells. I am sure that with such an appetite for snails these birds would go after *Achatina fulica* in a big way and these snails could well become its ideal food. The bush hens are prolific layers, burying their eggs in two feet deep holes which they dig themselves on hot sandy back-beach areas.

I recommend that the Department of Agriculture take a sufficient interest in my suggestion to start an experimental farm on a snail infested island to raise Megapodes on a large scale to be fed on *Achatina* and its eggs. The matter of protection of the birds and eggs should be strongly emphasized as the natives use both for food.

I also believe that the New Guinea cassowary or the South American ostrich or rhea of the Gran Chaco would eradicate the snails on a large scale if raised for this purpose.

## FOREIGN MOLLUSKS IN ARIZONA

ALBERT R. MEAD, University of Arizona

(Abstract)

*Helix aspersa* and *Limax flavus* have been found in many gardens in Tucson, Arizona, and were undoubtedly initially introduced more than ten years ago on infected nursery stock from California. *H. aspersa* has also established new records in Roswell and Las Cruces, New Mexico. *Rumina decollata* has recently been discovered in Mesa, Arizona. This record represents a considerable stride in the western march of this European species. It is felt that other foreign mollusks have become established in Arizona; but as in some other areas, these invaders have been overlooked because: there is a paucity of local malacologists; visiting malacologists invariably confine their activities to the wild areas rather than city gardens and nurseries; the snails and slugs are nocturnal in their habits which incidentally permits them to survive in areas where diurnal conditions are unfavorable; and damage to garden plants is often not recognized, or if so, it is associated with insects. Especially through the aid of infected nursery stock, these and other foreign mollusks will continue to spread. In most cases, once they become established, they will not be eradicated in spite of successful localized control programs. It is fortunate that most introduced snails in this country have been able to provide only a harassing effect to gardening and truck crops; this would not be the case for some foreign mollusks not yet introduced into this country.

## WEST AMERICAN TERTIARY MOLLUSCAN FAUNAS

A. MYRA KEEN

(Abstract)

The pattern of change in the Tertiary faunas of the West Coast was admirably described by Dr. J. P. Smith in several papers between the years 1895 and 1919. It is a tribute to his work that in the years since, the outlines of the picture he drew have not been greatly altered. In the present review some interpretations are added that are made possible by recent geologic research.

The earliest West American Tertiary faunas are Paleocene in age and represent the northwest outpost of the old Tethyan Sea. The succeeding Eocene faunas were also Tethyan and warm-water. From Oligocene time on there was an infiltration of Japonic forms and a progressive cooling, although the Miocene fauna still had close affinities with that of the Caribbean. During the Pliocene there were both warm-water and cold-water phases, as also during the Pleistocene. The closing of the strait between North and South America during late Miocene started the development of modern temperature provinces and a differentiation into restricted geographic areas. These provinces seem to have become increasingly clear-cut since Pleistocene time.

## MANAGEMENT PROBLEMS OF A MOLLUSCAN SPORT FISHERY

JOHN FITCH

(Abstract)

Aim of the Bureau of Marine Fisheries, California Dept. of Fish and Game is to forward policies and recommend regulations which will be most suitable for a sustained fishery at the highest level possible. Tools used to accomplish this are: Closed seasons, closed areas, gear restrictions, licensing, size limits, bag limits, etc.

Closed areas used to build up clam populations should be watched closely enough that when the situation which prompted closure no longer exists, the beach should again be opened for digging.

Management of the Pismo clams first started in 1911 when the bag limit was placed at 200 per individual and a size limit of 13 inches circumference was set. Pismo clam census was first made in 1923 and has been conducted each year since except for war years 1942 thru 1946. The present plan is to reduce the minimum size limit to 4 inches diam. within the next year. This will make some 90 to 95 per cent more clams available.

## THE NORTHERN CALIFORNIA MALACOZOOLOGICAL CLUB

RALPH O. FOX

(Abstract)

In an effort to organize a "shell club" in the East Bay section of San Francisco Bay area, a list of eighteen names of interested people was compiled. A committee of three local A.M.U. members then went to work. Fourteen were present at the first meeting at the home of Miss Helen Burton. The evening was spent checking the background, interest and desires of each, and where they would like emphasis to be placed if the Club should be organized. Many were interested too in the other animals found associated with the mollusks. Hence the name came into being and has been helpful in encouraging participation of zoologists of the University of California.

Officers were elected — Ralph O. Fox, President; Helen Burton, Vice President, and Lucille Zellers, Secretary-Treasurer. Dues are \$1.00 a year. The Club meets the first Tuesday of each month at the Oakland Public Museum, on the shores of Lake Merritt. The meetings start at 8:00 and close at 10:00. The original membership of 11 has through the past several months grown to 33 and has resulted through good publicity and carefully chosen speakers.

A study collection will be deposited in the Museum and an educational program is planned, including the organization of a Junior group. A survey of a section of the Coast north of the Bay area will be undertaken as a Club project.

## ENVIRONMENTAL CHANGE ON MOLLUSCAN LIFE IN MISSION BAY, SAN DIEGO

Roy L. MORRISON  
(Briefed by Secretary)

Shortly before 1930 Mr. Morrison made a detailed survey of Mission Bay, also called False Bay. At that time he found an extensive shore line and nine different types of habitat making for an extremely varied fauna.

Many collectors have visited this area since Lamarck was here in 1799; but there have been few systematic studies. In Orcutt's list, made in 1885, 102 of the 249 species found in the vicinity of San Diego came from Mission Bay. In a series of regular and frequent visits covering every month of the year Mr. Morrison took 153 species, (67 bivalves and 86 univalves) representing 67 families. About a dozen others have been taken since. During the years between this survey and one made this year (1952), increasing population and new highways have made many changes and destroyed many collecting grounds; but a Marine Recreational area has now been established there, and many long-missing forms are apparently returning.

## PTEROPODS COLLECTION BY THE ALLAN HANCOCK FOUNDATION

ARTHUR D. HOWARD  
(Abstract)

We have three methods of collecting these small pelagic forms, sometimes called sea butterflies.

- (a) By tow-net—as far down as 300 fathoms
- (b) In the stomachs of fishes
- (c) By dredging and bottom sampling of deposits on the ocean floor.

Among those collected by the Allan Hancock Foundation and shown by lantern slides were 10 species of shell-bearing algae and protozoan-eating pteropods—divided into 2 families and 5 genera and 1 of the shell-less type which feeds on animals and other swimming plankton.

## THE INFLUENCE OF UPWELLING ON THE DISTRIBUTION OF MARINE FLORAS AND FAUNAS OF THE WEST COAST OF BAJA CALIFORNIA, MEXICO

WILLIAM K. EMERSON  
(Abstract)

A series of surface temperature observations and bathythermographs undertaken by Dawson (1951) demonstrated the occurrence of upwelling of

cold water in localized areas along virtually the entire Pacific coast of Baja California. Dawson's distributional study of the marine vegetation of this coast and the outlying islands showed a close correlation with the presence or absence of upwelling water. Within the upwelling areas many genera and species indicative of cool northern waters occur far south of their expected latitudinal range. A similar correlation between the low temperatures and the distribution of marine animals, particularly fishes, is indicated by Hubbs (1948).

The presence of coastal upwelling allows phychrophilic (cold-limited) organisms to flourish in localized advantageous ecological habitats of the intertidal zone in a "warm water" faunal province, producing a discontinuous inner-neritic distribution for the species involved. The influence of upwelling on distribution of marine organisms, particularly benthic forms, demonstrates the advantage of utilizing thermophilic (warm-limited) species as indices for the interpretation of former climatic condition of fossil faunal assemblages.

## A FORGOTTEN EPISODE IN THE HISTORY OF PALEONTOLOGY

JOSHUA L. BAILY, JR.

### (Abstract)

A short paper by Joshua L. Baily, Jr. was read before the group. It told about an extremely rare and valuable book on fossils that was written in 1723 by an Austrian professor named Berliner.

At that time fossils were believed to be the handiwork of the devil, who indulged in the pastime of their manufacture for the purpose of misleading and confusing honest naturalists. Professor Berlinger used to dig in a fossil bed near the university at which he taught, and then display his findings at his classes as specimens of the devil's expert craftsmanship. Evidently his students decided to make some fossils, bury them in the fossil beds and fool the professor. They proceeded to make of suitable sandstone graven images of everything that they could think of. They even made one of a spider, seated in the middle of its web, with a fly entangled in the marginal meshes. As this bit of foolishness was successful as far as Professor Berliner was concerned, the students were encouraged to go even farther. They carved letters of the Hebrew alphabet on pieces of sandstone and buried them in the fossil bed. When the professor found these, he told the students that he had found proof that the language of the devil was Hebrew. He also told them that he had employed the best available scientific artist to prepare illustrations of all the specimens taken. This book of illustrations he published in book form and distributed in all the leading libraries of Europe.

The students were then frightened at their own actions. Finally, they ended their misrepresentations by carving the professor's own name on sandstone and burying it in the fossil bed. Upon finding this petroglyph Professor Berlinger knew that he had been fooled and he tried to recover all the books of the illustrations. He bought back a good many but the remainder became collector's items and he was unable to recover all of them.

After Professor Berliner's death, his son used the same plates and reprinted the book. These copies he sold for fancy prices until too many were put on the market. Finally, collectors discovered that the originals all had serial numbers, which the reprints lacked. The reprints, therefore, dropped in value.

## THE STATUS QUO OF THE PROBLEM OF THE GIANT AFRICAN SNAIL

ALBERT R. MEAD  
University of Arizona  
(Abstract)

So far as known, the giant African snail (*Achatina fulica*) has not become established in continental USA in spite of the confusion that arose in the fall of 1951 over the newspaper accounts of the so-called "African striped snail" (*Otala lactea*) in California. Interceptions of *Achatina fulica* have shown a marked increase. The snail is still in Hawaii and is holding its ground after fourteen years of rigorous control measures. The field of biological control is currently being further explored. Yoshio Kondo of the Bishop Museum has been continuing his studies of *Gonaxis kibweziensis* in quarantine and at this moment is conducting an examination of the introduced population of this predatory snail on Agiguan in the Marianas Islands. Last year, J. L. Chamberlain of Harvard and R. P. Owen, Quarantine Officer of the Trust Territory, explored Agiguan and reported the firm establishment of *G. kibweziensis*. The giant carabid beetle *Tefflus*, other predatory snails (e.g. paryphantids of Australia), and presumed parasitic flies of East Africa have also been investigated. In the chemical control limelight is Dr. W. H. Lange, of the University of California, who is currently carrying on experiments designed to test the molluscicide properties of numerous "baits" and chemicals, including certain of the very new insecticides. An investigation into the commercial possibilities of the dried snails is continuing at the University of Arizona and a preliminary report is in progress. There is also being written under a Sigma Xi-RESA grant a report on the economic aspects of this problem, the preparation of which has revealed an urgent need for additional field work. Quarantine regulations, demanded by the passage of H.R.4443 and S.1489, are still in the process of preparation in Washington, D. C.

## HAWAIIAN GASTROPODS

By

Bernice P. Bishop Museum, Waikiki Aquarium, and the Committee on  
Natural Sciences for Youth of the Outdoor Circle, Hawaii.

(Abstract)

This very interesting program was given following the Saturday night banquet in a unique fashion. A tape recording, accompanying forty very beautiful colored transparencies of Hawaiian gastropods were sent from Hawaii. The voice on the recorder was that of E. H. Bryan, Jr. of the Bernice P. Bishop Museum. Spencer Tinker, director of the Waikiki Aquarium, made most of the pictures.

As Mr. Bryan states on his tape recording, they had three objectives in mind in sending this program: first, to give us a glimpse of some of the shells which delight the hearts of collectors in the mid-Pacific; second, to tell us about various recent efforts being made to popularize natural history in these islands, especially among young people; and third, to try to demonstrate a new method of presentation, which they hope may prove to be helpful to persons, like themselves, who live too far away to get to scientific meetings easily or often.

## A.M.U.P. REGISTRATIONS (1952)

Mr. and Mrs. R. L. Alexander	Dr. and Mrs. A. O. Howard
Mr. Joel R. M. Allbee	Mr. and Mrs. George Kanakoff
Mr. Kenneth Althouse	Dr. A. Myra Keen
Mr. Ralph Akerley, Jr.	Mrs. Bernice Leland
Mr. David Baker	Dr. Irene McCulloch
Mr. and Mrs. R. G. Beck	Mr. Martin M. McGaughey
Dr. S. S. Berry	Dr. W. E. Martin
Mr. and Mrs. Ralph Bormann	Mrs. N. Matzen
Mr. and Mrs. John Q. Burch	Dr. Albert R. Mead
Mr. and Mrs. E. P. Chace	Mr. and Mrs. Helmut Meier
Mrs. Emma W. Coats	Mr. R. L. Morrison
Mr. George Coats	Miss Mae Plumb
Miss Ruth M. Coats	Mr. Arthur C. Price
Miss Ruth E. Eaton	Mr. Glen Russell
Mr. and Mrs. H. A. Edwards	Mr. Morris Schick
Mr. W. K. Emerson	Mr. Allyn G. Smith
Mr. and Mrs. H. T. Farmer	Miss Agnes Shumate
Mr. John Fitch	Mr. Andrew Sorensen
Mr. and Mrs. Howard L. Fletcher	Miss Myrle A. Sprague
Mr. Ralph O. Fox	Mr. John P. Strobeens
Mr. and Mrs. Mead French	Mrs. Harriet W. Thomson
Dr. W. O. Gregg	Mrs. John K. Tompkins
Mr. Gilbert C. Grau	Mr. and Mrs. Harry Turver
Mr. Edward Gueguen	Mr. Munroe L. Walton
Mrs. L. Heard	Mrs. Hazel Whelchel
Dr. and Mrs. H. R. Hill	Mrs. Ruth C. Whitney
Mr. Merton E. Hinshaw	Mr. Ernest Wilcox
Mr. A. L. Hoffman	Mrs. Oro Willett

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By recent action of the Executive Council, it is now possible to secure life membership in the American Malacological Union by payment of the sum of twenty-five dollars.

\* \* \*

From Dr. Henry C. Shetrone, Columbus, Ohio: "I have just installed in our State Museum, of which I am director emeritus, a display of ten or more species of marine shells which, during my many years of exploration, I found in prehistoric Ohio burial mounds, and alongside these, fresh specimens of the same species, all with their scientific identifications. Makes quite a display.

It has been lots of fun identifying the old shells, and difficult, since they are faded, cut into different forms, and often scorched in the ceremonial fires of the mound-builders.

Will have a technical paper on the subject shortly."

## ACTIVE MEMBERS

- Abbott, R. Tucker, U. S. National Museum, Washington 25, D. C.  
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Aldrich Museum, 12 Bay Island, Balboa, Cal. Conch., and mineralogy exch.  
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Athearn, Mrs. Roy C., 5105 No. Main St., Fall River, Mass. Land shells.  
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Braun, Garwood A., Wittenberg College, Springfield, Ohio. Unionidae.  
Brewster, Miss Helen, 333 5th St., So., St. Petersburg 5, Fla., and E. Troy, Wisc.  
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Chen, Sui-fong, 1501 New Hampshire Ave., Washington 6, D. C.  
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Church, Austin, 140 St. Joseph Ave., P. O. Drawer "C", Trenton, Mich.  
Ciarla, Otello, Rua Laurinda Santos Lobo, 311 Santa Theresia, Rio de Janeiro, Brazil.  
Claar, Elmer A., 1400 Lake Shore Dr., Chicago 10, Ill. *Cypraea*.  
Clarke, Arthur H. Jr., 19 Theurer Park, Watertown, Mass. Sphaeridae; New England Marines.  
Clark, Mrs. Effie M., P. O. Box 511, Yuba City, Cal.  
Clench Conchological Club, 12 State St., Worcester 8, Mass. Shells and their collection.  
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## IN MEMORIAM

Mr. A. M. Strong, Balboa, California

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**AMERICAN MALACOLOGICAL UNION**  
**AND**  
**AMERICAN MALACOLOGICAL UNION,**  
**PACIFIC DIVISION**

**ANNUAL REPORT**

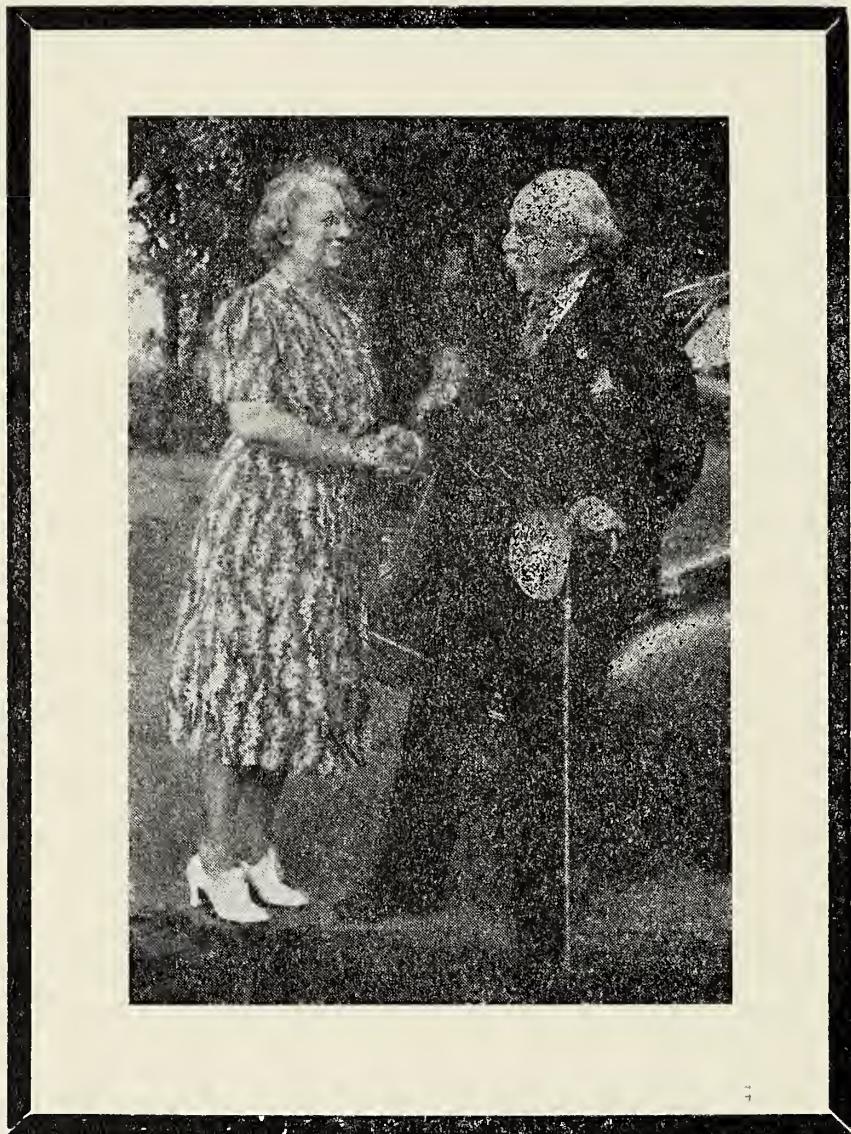


**DECEMBER 31, 1953**

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**Imogene S. Robertson and Dr. Carlos de la Torre**

## **IMOGENE STRICKLER ROBERTSON**

### **1872 - 1953**

When, on February sixth, 1953, this versatile woman succumbed to an illness of several months, she left not one empty space but several. A devoted mother, she is sadly missed by her bereft family. Her passing is felt keenly by the congregation of the church of which she was a life-long member. President of one scientific society and charter member of another, chairs are left vacant which will not easily be filled. The loss of the Research Associate in Malacology leaves the Buffalo Museum of Science without an authority on a subject which seems to be taking a new hold on public fancy. And finally, during the twenty years she served as secretary of the American Malacological Union literally hundreds of persons came to love this friendly woman who gave patient and detailed attention to their requests for information or advice.

A life-long friend once said, "Genie had a head start, for she was born with dimples, a tranquil disposition, and an inquiring mind." It was this latter attribute, never waning, which caused her to delve deeply into any subject which engaged her interest.

The home in which she resided for seventy-seven of her eighty years was built upon a shelf of Stafford limestone rich in fossils. The earliest playthings of the little girl were the oddly shaped "pebbles" which she picked from the blasted ledge behind her home; she often recounted the wonder with which she learned that these grey things once lived beneath an ancient sea. Never classing herself as even an amateur paleontologist, she nonetheless made detailed study of the fossils of her own neighborhood and later of those in the collection of the Buffalo Museum of Science. In an accounting of this early interest, she says,\* "It is probably fitting, therefore, that the only mollusk to bear my name is a fossil cephalopod. (*Tylorthoceras robertsonae* Flower.)

The early years of this gifted child were filled with happy experiences which many decades later she liked to recall. Flowers and trees, stones, birds and animals—she knew and loved them all. For although the Strickler-Robertson home now stands in the midst of a residential area of a great city, it was at that time bordered by open fields and by woods which but a few short years before had harboured the remnants of the once-savage Senecas.

Recognizing that this love of the wild things about her was a creditable thing and to be encouraged, a wise mother presented her fifteen-year-old daughter with a good microscope; from that day until a few months before her death it was in almost daily use. "Specialize!" urged friends and teachers. But the world was too filled with microscopic wonders for her to disregard any one in favor of another. Minute sculpture on a shell, an arrangement of diatoms, a teeming drop from the rain barrel—all was grist for the mill.

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\* ("The Mollusca of the Niagara Frontier Region," Robertson-Blakeslee.)

But her interest was not confined to scientific subjects; as a direct descendant of John and Priscilla Alden, she was proud of her heritage, studied and charted her genealogical tree with painstaking thoroughness, acquiring too a wide knowledge of New England history. Further proof of her versatility lies in the fact that in the 1890s she taught music and tutored pupils in arithmetic! It was during this decade that she joined the newly-organized Conchological Section of the Buffalo Society of Natural Sciences, a group which from 1936 until her death she served as president.

Not only New England history engaged the attention of the young woman. Indian history had so recently been made in the area of her home that she came upon the evidences frequently: arrowheads, shards, and once a bead wedged within the crack of a rock came to light when a delicate lichen was removed for microscopic study.

Directly across the road from the Strickler home was a burying ground of the Senecas, and there for many years rested the body of their noble Chief, Red Jacket. Eventually his remains were removed, together with those of his people who slept beside him, and later re-interred in Forest Lawn Cemetery in Buffalo. The tiny plot (then owned by Imogene's father) was opened to archaeological exploration; before the turn of the century three kitchen middens had been excavated, yielding cultural data on tribes so ancient that not even in Iroquois legend was their existence recorded.

All of this was extremely interesting to the young woman, and when she was given the privilege of excavating one of the middens, her delight knew no bounds. The artifacts and other objects discovered by her colleagues were deposited in the Buffalo Historical Society and the Buffalo Society of Natural Sciences, but her finds went into her private collection and were a source of life-long enjoyment. One of the most interesting objects to come to light was a single specimen of *Mesodon sayanus* (Pilsbry), the illustration of which appears in "The Mollusca of the Niagara Frontier Region." In the more than half-century since this discovery, no other specimen of this mollusk has been collected within fifty miles of this site.

In later years Mrs. Robertson became an authority on the ancient and recent cultures of the Indians of Western New York, and her last published work was a history of the old burying ground, now a city park. Running serially in her neighborhood newspaper, the second installment appeared in the edition which announced her death.

In 1903 Imogene Christabel Strickler married Harold Ralph Robertson of Liverpool, England, and Philadelphia. To this union were born five children, four of whom survive, together with eleven grandchildren and three great-grandchildren. Mr. Robertson died in 1951, and so was ended nearly a half-century of an ideal relationship. He too loved the world of nature, and soon after their marriage joined the Conchological Section. Together they started and built a magnificent collection of shells, another of minerals.

Because of her knowledge of shells it was to Mrs. Robertson that the Director of the Buffalo Society of Natural Sciences turned when in 1926 the present building which houses the Buffalo Museum of Science was under construction; it was felt desirable that the several long-neglected collections of shells which were gathering dust in the basement of the old building be consolidated. Offered the post of Curator of Conchology, she accepted and plunged into the new work with customary zest. Two years were required to complete the task of unionization, but at the end of that time, the museum

could boast of a hall of shells quite fine enough to grace the new structure, together with an extensive study collection arranged and cataloged for ready reference.

In her fifteen years' affiliation with the museum, she was given the additional posts of Curator of Biology, Science Editor, Registrar, and Librarian of the museum's collection of microscopical slides. Retired in 1942, she was made Research Associate in Malacology, a position she occupied at the time of her death.

Retirement afforded an opportunity to accomplish a task long contemplated, the preparation of a popular guide book to the local mollusks. The check-list compiled by Dr. Elizabeth J. Letson in 1909 had long been outdated due to changes in nomenclature and to the activities of local collectors who had added many new species to the area record. So, advised by Mr. Robertson and with the collaboration of Mr. Clifford L. Blakeslee (himself retired and an enthusiastic collector) she plunged into the work of compiling "The Mollusca of the Niagara Frontier Region," which was published by the Buffalo Society of Natural Sciences in 1948.

Mr. and Mrs. Robertson were active in the organization of the American Malacological Union in 1932; elected Financial Secretary at the first meeting, she served until 1951 when she resigned to accept nomination as Vice-President.

It was in her capacity as secretary that Imogene carved for herself a lasting niche in the hearts of her fellows, for she was unfailing in what she considered the greatest of her duties, that of affording every encouragement to any person to seek her aid. She saw the organization double in size, and no small factor in that growth was the patient effort of a secretary who did not feel that her duties stopped with the mailing of announcements and form letters.

She made no claim to being other than an amateur, never described a shell, preferring rather to serve science by catering to the needs of the men and women of science. Appreciation of this attitude is expressed in the closing lines of a letter written by one who has often benefitted from her kindness: "She was an inspiration to many collectors, amateur and professionals. Perhaps our loss can be tempered with the thought that when some of us finally take passage across the River Styx, we shall forever be condemned to sit and identify the species we have described, while Mrs. Robertson will be free to wander over sunny Elysian meadows and gather in quantity the rarest and most beautiful of mollusks. May I join her friends and fellow-club members in wishing her happy hunting."

And so say we all. Good shelling, Imogene!

MARGARET C. TESKEY

# **THE NINETEENTH ANNUAL MEETING OF THE AMERICAN MALACOLOGICAL UNION**

Two's company; three's a crowd; and seventeen's a convention! Although the nineteenth annual meeting of the American Malacological Union, held in Lawrence, Kansas, was attended by one of the smallest crowds in A. M. U. history, there was a unanimous opinion that the 1953 convention was one of the most pleasant and successful gatherings we have had in many years. No doubt, the record heat wave that preceded the meetings had an influence on the attendance, but by good fortune the weatherman cooperated by timing the arrival of a cooling thunderstorm with the opening of the meetings on June 25. The temperature remained in the cool, mid-80's until the termination of the meetings on June 27.

To Dr. A. Byron Leonard, this year's president, and to his charming wife, goes the credit for the smooth unfolding of the three-day program. Because of the small registration, the morning Executive Council meeting was open to all members, which made an efficient session for the transaction of business and open meeting matters.

Reports of the Secretary-Treasurer showed a cash balance of \$433.39, and a life-membership fund of \$125. Total membership as of June 1, 1953, was 467—a gain over the previous year of 6 per cent. These reports were approved as read.

The following panel of nominated officers was presented: President, Dr. Joseph C. Bequaert; Vice-President, Morris K. Jacobson; Second Vice-President, Elsie M. Chace; Secretary-Treasurer, Margaret C. Teskey; Councilmen-at-Large, R. Tucker Abbott, Ralph W. Jackson, Dr. Miguel L. Jaume, Dr. Albert R. Mead. It was moved, seconded and carried that this panel be elected, to serve from the close of the current meeting until the close of the 1954 meeting.

Announcement was made of the following business transacted by the Executive Council: a revision of the A.M.U. Constitution, drafted by the committee appointed for this task, was submitted to and approved by the council; it will appear in the report bulletin for 1953, and members will be polled by mail. The invitation of Dr. George M. Moore to hold the 1954 meeting at the University of New Hampshire was accepted, the date to be fixed and announced at a later time. As a token of recognition of meritorious service, honorary life memberships in the American Malacological Union were bestowed upon the following: Dr. Paul Bartsch, Dr. S. Stillman Berry, and Dr. Henry A. Pilsbry. (At this time, and in reply to a query from the A.M.U. Pacific Division regarding the propriety of that body bestowing honorary life memberships, and whether or not such memberships may apply as well to the parent organization, it was announced following thorough discussion that while the A.M.U. approves and encourages such recognition by and within the divisional branch and member clubs, the Executive Council reserves the right to award honorary life memberships to the American Malacological Union.)

As the annual business meeting concluded, President A. Byron Leonard officially opened the nineteenth annual meeting by introducing Dr. George B. Smith, Dean of the University of Kansas. Dean Smith voiced a gracious welcome and spoke with justifiable pride of the Student's Union Building under whose roof all sessions and the annual dinner were held. Delegates were invited to enjoy any or all of the facilities provided on the campus. "And do come back another time, officially or not," he said.

On behalf of the A.M.U., President Leonard extended thanks for the hospitality being enjoyed by the organization. Then, President-elect Joseph C. Bequaert assumed the chair and introduced Dr. Leonard as the first speaker:

## FOSSIL MOLLUSKS AND PLEISTOCENE STRATIGRAPHY IN CENTRAL UNITED STATES

### (Abstract)

Nowhere in the world have terrestrial and freshwater Mollusca contributed more to a knowledge of Quaternary (Pleistocene) geology than in the central United States. Faunas are widespread and populous. Distinctive assemblages are recognized over distances nearly 1000 miles in extent; locally, fossil shells often occur at the rate of several thousand per cubic foot. Six distinctive molluscan faunal assemblages, associated respectively with Nebraskan, Kansan, Illinoian, Iowan, Tazewellian and Careyan-Mankatoan deposits, are represented by several hundred local collections. These assemblages have contributed to a knowledge of Quaternary stratigraphy (1) By making it possible, together with other data, to recognize the sequential order of Quaternary depositional cycles, by making it possible to correlate parts of undifferentiated Wisconsinan sediments with Iowan, Tazewellian or Careyan-Mankatoan depositional cycles; (2) By assisting in the establishment of a firm correlation between sedimentary cycles beyond the glaciated region with those within it; (3) By strongly supporting the thesis that extensive deposits of massive silt in this region are eolian in origin, and by contributing to an understanding of the paleoecology of their deposition; (4) By bringing to light evidence of persistent, orthogenetic climatic trends that transcend the repetitive appearance of pluvial periods; and (5) By proving to be a readily useful tool in practical field stratigraphy.

Dr. Leonard's paper was illustrated by several charts and graphs: Bequaert: "Did you tie in temperature when compiling these charts?" Leonard: "Yes." Abbott: "Was this (Kansan) period colder than now?" Leonard: "Yes, but I think not much. Certainly not Arctic. Though the climatic pattern has altered, I hesitate to cite definite limits."

As Dr. Leonard concluded and again took over as chairman, he introduced Dr. Albert R. Mead of the University of Arizona.

## THE ECONOMIC SIGNIFICANCE OF USING GIANT AFRICAN SNAIL MEAL AS POULTRY FEED

### (Abstract)

In the February 6, 1953 issue of *Science*, Mead and Kemmerer published a preliminary report on amino acid assays of giant African snail meal. They showed that arginine was  $2\frac{1}{3}$  and lysine  $1\frac{1}{3}$  times that of

whole egg. The essential lysine is notoriously lacking in plant protein sources, e.g. cotton seed meal. It is present in animal protein sources such as blood meal and fish meal, but these are expensive to use as feed supplements. Additional experiments are currently in progress at the University of Arizona to determine, through controlled chick feeding, the growth promoting potential of the snail meal and the practicability of using it as a source of essential amino acids in poultry and live stock feeds.

The economic significance of making use of giant African snails as a feed supplement is twofold. First of all, the poultry industry especially is seriously curbed in many regions of the world because of the scarcity and cost of imported "balanced" feeds. One of the most expensive items in these feeds is animal protein; and it is not only abundantly on hand in the snail infested areas, but free for the taking. And secondly, the collecting of snails for this purpose is bound to have a control effect. Create a demand for anything and it becomes scarce. If through a continuing program of collecting the snails, their numbers could be reduced from "abundant" to just "common", the giant snail would cease to exist as a problem. Man always has been the worst enemy of the giant African snails. With few exceptions, man will not eat them in the Pacific areas; nor is it possible to teach him to eat them. But we should be able to persuade him to feed the snails to his poultry.

It is not assumed that the snail meal will be prepared on a large scale or enter appreciably into commercial traffic. A localized plan for "harvesting" the snails could be set up on a small scale, rotation basis. There would always be enough "seed" unavoidably left to permit a recovery of the population in a relatively short period of time. It is a paradox that *Achatina fulica* feeds largely on unwanted decaying and rotting substances and converts them into a high grade proteinaceous material, of which there is never enough, and yet all current methods of controlling this snail pest are conspicuously devoid of any attempt to make use of the snails after they are killed. A constructive rather than destructive approach to the problem is urged.

Bequaert: "Has a satisfactory drying process been perfected?"

Mead: "This problem is still being explored. If the temperature is maintained at too high or too low a level, the essential nutrients become altered. In Guam, George Peterson found that an oven temperature of 70° C. for 24 to 30 hours proved most satisfactory. Maintaining the snail meal at a proper degree of dryness in humid climates is of course still another problem."

Abbott: "But why dry them? Won't chickens feed on almost anything?"

Mead: "No, chickens can be rather fussy. Experimentations so far suggest that the snails can be incorporated into the diet most successfully in the dry meal form. Dr. Keen knows from first hand experience that chickens can be pretty temperamental in their feeding habits."

Keen: "We raised chickens in Colorado and in California and we found that they had very different appetites, even as to corn."

Abbott: "Ducks like snails, I understand. Why not raise ducks on snail-infested islands?"

Mead: "Many of the Oriental people have done this for years. But as egg producers, chickens are generally preferred. Both chickens and eggs are perennially scarce items in the islands of the Pacific and in the Orient. When we were in Guam, chicken eggs sold for \$2.50 a dozen."

Schwengel: "Must the snails be taken from the shell?"

Mead: "This has been done in all our experiments so far. However, the chickens require a source of calcium; this suggests immediately that at least a portion of the snail shell should go into the meal. Incidentally, it should be understood that our experiments are directed toward augmenting any program of control of the giant snail and not toward their cultivation. Eradication still is not possible; therefore a premium has been put on developing new methods of control."

Bequaert: "On the Gold Coast of Africa, *Achatina* is protected as an important food item. There they nourish the native, not his chickens. I refer to the larger species, *Achatina achatina*. No eradication problem exists there."

At close of discussion following this paper came a two-hour break for lunch, an excellent cafeteria being at hand in the basement of the building.

Opening the afternoon session was

## THE SNAIL HOSTS OF SCHISTOSOMIASIS IN BRITISH WEST AFRICA AND THEIR CONTROL

DR. ELMER G. BERRY

U. S. Dept. of Health, Education and Welfare, National Institutes of Health, Laboratory of Tropical Diseases, Bethesda, Md.

### (Abstract)

An investigation of the snail hosts of *Schistosoma mansoni* and *S. haematobium* was made in the British West African Colonies during 1950-1952 under the auspices of the Mutual Security Administration. *S. haematobium* was found to have a much wider distribution than *S. mansoni*, and in certain areas all of the children were infected with one or both of these worms. *Physopsis africana* was the principal intermediate host in the life cycle of *S. haematobium*, but other species of snails belonging to the genera *Bulinus* and *Pyrgophysa* were also found infected in certain isolated regions of the British Cameroons and Nigeria. Endemic areas of *S. mansoni* were found sporadically in all of the colonies, but only one species of snail, *Biomphalaria pfeifferi*, was found involved in its life cycle.

From more than two thousand chemical compounds tested in the Laboratory of Tropical Diseases at the National Institutes of Health in its search for better molluscacides a few of the more promising were given field trials in West Africa. Considering the excellent killing effect on the snail hosts and yet its low toxicity to man and his domestic animals, the ease of application, its availability and low cost, the chemical of choice at the present time seems to be sodium pentachlorophenate. A single application of this compound in one locality, Rigachigun in northern Nigeria killed all the intermediate hosts of both *S. haematobium* and *S. mansoni* and gave complete control for a period of sixteen months. The cost of the chemical used in the treatment of this area was less than a half cent per person for the total population of the entire village.

Dr. Berry's paper was illustrated by colored slides which charted the life cycle of Schistosomiasis, ecology of the countryside, waterways, pools, etc. Especially interesting though distressing were close-ups of infected children. A chart of stations in the territories of Nigeria, Gold Coast and Sierra Leone brought several questions: Abbott: "Are you here charting the presence of carrier snails or cases (of Schistosomiasis?)" Berry: "Snails; but in all cases the disease was also present." Abbott: "How many species of host snails are present in Africa?" Berry: "Two which probably harbor Schistosomiasis

haematobium, and one which carries mansoni." Haas: "Is anybody else working on this problem?" Berry: "Yes, several countries have a research or control program; the British are especially active. However, very little work is done on the taxonomy of the snail host."

Following Dr. Berry's paper brief announcements were made; greetings from Dr. and Mrs. Henry van der Schalie in Egypt were relayed, and a telegram from Mrs. Margaret M. Teare of Buffalo, N. Y. was read, expressing disappointment at being unable to be present.

Dr. Fritz Haas of the Chicago Natural History Museum made a short report on the private collection of non-marine shells of Walter F. Webb. This collection was purchased by the museum in 1941 for \$3,600, and only now, twelve years later, has the monumental task of cataloging been completed. As the work progressed unsuspected treasures came to light, such as the complete collection of helicoid snails of Gerard K. Gude, complete except for the types which had gone to the British Museum. "Webb had been a clever horse trader in his deals with various museums," remarked Dr. Haas. The entire collection of John Richie, Jr., of Boston was there, together with about eighty per cent of the Japanese species described by Pilsbry. Many lots bearing the labels of Binney, Dall, Dautzenberg and other celebrities were brought to light. Altogether this huge collection of 20,000 lots, a million specimens more or less, yielded 670 paratypes, 12 holotypes and much undescribed material; twelve years was not too long to do it justice. "But nothing is perfect," said Dr. Haas in closing; "Webb relied too much upon his memory and so much detective work was necessary. One bit of advice cannot be too much stressed: when writing labels, DON'T ABBREVIATE!"

## A PROGRESS REPORT ON SOME REVISIONS FOR THE "TREATISE OF INVERTEBRATE PALEONTOLOGY"

DR. A. MYRA KEEN  
Stanford University

### (Abstract)

Rewvisions for the "Treatise of Invertebrate Paleontology" cover not only taxonomic data but include notes on distribution in time and space. After a worker has surveyed a few families, it is interesting to take stock of findings and to contrast the problems encountered. Such is the purpose of this review of three groups.

The pelecypod family Cardiidae (restricted) apparently originated during Upper Triassic time and now comprises some 58 genera and subgenera that group readily into 5 subfamilies. Three of these may have branched from the other two: Fraginae and Trachycardiinae from Cardiinae; and Laevicardiinae from Protocardiinae. However, the early members of Protocardiinae and Cardiinae seem not to be closely related. The origin of the family thus remains obscure, for more work is needed on Triassic Pelecypoda.

The Veneridae are a much more complex family. Some 267 names have been bestowed on genera and subgenera presumed to belong in the family, of which 183 seem justified. The modern forms (Tertiary and Recent) may be grouped into 11 subfamilies, but their relationships to earlier stocks have yet to be worked out. Apparently the venerid pattern of shell (three cardinal hinge teeth and a pallial sinus) originated among

at least three different ancestral families during Jurassic time. The modern descendants are thus basically not as homogeneous as they superficially appear.

These problems of classification are of more than theoretical significance, for in a collaborative work such as this, unless authors are agreed upon the limits of families, some genera may be included twice in different sections of the "Treatise" and others omitted entirely.

The gastropod family Vermetidae presents problems not so much of origin as of content. Both in the fossil and in the Recent record these sedentary snails have been confused with other invertebrates—not only with members of the related gastropod family Vermiculariidae but also with the unrelated tube-dwelling annelid worms. The life history of the Vermetidae is distinctive, for the neopionic young, after leaving the brood pouch of the adult, attach themselves to some object and the axis of coiling of the shell changes by 90°. Classification of genera in this family seems best made on shape of the nuclear whorls, nature of the operculum, and manner of coiling of the adult shell. Isolated sections of tubes are useless in identification. Some 30 generic names have been proposed in this group, of which 8 may be useful. Taxonomic problems are numerous, and several—such as the validity of the type genus—are yet unresolved. The very name *Vermetus* stands on a doubtful foundation. So also do *Spiroglyphus* and *Lemintina*, the next two names in point of time, for all were confused by their authors with annelid worms. It may be desirable to abandon several of the dubious names and to make, as it were, a fresh start in nomenclature by adopting later unequivocal names.

Dr. Keen had prepared charts and drawings to illustrate points made in her paper. The following discussion ensued: Abbott: "In your study of Vermetidae did you make any radular studies?" Keen: "No; as a paleontologist I have been striving to arrive at a classification that will use only those parts available in a fossil record. I sent all available soft part of animals to Mr. John Morton, a New Zealand zoologist who is interested in vermetid anatomy. His dissections so far have been in complete confirmation of my findings." Morrison: "I think there is an interesting correlation between *Siliquaria* and *Vermetus*." Mead: "Then you have the mechanics of getting into the substrate, as in the case where the vermetid corrodes a channel in *Haliotis*. How is this done, by resorption? Has anyone studied it?" Keen: "Not so far as I know. I have puzzled about it, for it is hard to see how the animal can extend the tube horizontally along the surface into which it is corroding the channel and still keep a vertically directed apertural opening. I might also mention that early workers considered these animals to be sometimes sinistrally coiled, sometimes dextrally, depending upon the manner of attachment of the initial whorl. In this I disagree; the coiling seems to be uniformly dextral. The apparently sinistral coiling is an illusion of the observer who has confused apex with base."

## 'SOME PECULIARITIES OF THE WEST AFRICAN TERRESTRIAL MOLLUSCAN FAUNA'

DR. JOSEPH C. BEQUAERT

Museum of Comparative Zoology, Harvard University

A group photograph was taken at the close of the first day's session and after a brief hour during which time the ravages of the day were repaired,

everybody assembled in the Grill Room of the Eldridge Hotel as guests of Dr. Jeanne S. Schwengel and of General Frank R. Schwengel who sent his regrets at being unable to be present.

This was the eleventh occasion upon which delegates attending A.M.U. annual meetings have been entertained by the Schwengels, and each has been a memorable affair. Although not announced as such, and regardless of the date, these annual parties are in honor of Dr. Schwengel's birthday, and are a gift to her and to her friends from the General. Combined as usual was a cocktail hour and a buffet supper, and 1953 will go down in A.M.U. history as the year of the delicious smoked spareribs!

Friday brought more good weather and a full day of papers. The morning session opened with an hour-long film accompanied by the running commentary of Dr. Joseph P. E. Morrison. The color movies were his own, constituting a graphic report of his three month trip to Raroia Atoll in the Tuamotu Islands, French Oceania. There he was the general zoologist for the 1952 Pacific Science Board Expedition working on ecological surveys of coral atolls. Highlights of this absorbing travelogue picture included the annual 14th of July celebration at Raroia. This is the French equivalent of our 4th of July. That day's scenes featured the native parades and speeches which officially honored the expedition members and a French admiral (retired) who was there on a visit. There were also the native sailing canoe races, and an impromptu solo dance by another native oblivious to the camera. Dr. Morrison's scenes of the sea-birds leaving their rookeries on certain islands at Raroia were excellent in showing the habitat at dawn, but the birds didn't wait for enough light for the color film to show them very well. Especially interesting was Dr. Morrison's comment that after the party reached Raroia much of his work of preparing specimens collected on outlying and uninhabited islands of the atoll was done in shade afforded by one of the dismantled sails of the famous raft Kon-Tiki.

## A PRELIMINARY REPORT ON THE MOLLUSCAN TYPES OF FRANK COLLINS BAKER

DR. DOROTHEA FRANZEN  
Illinois Wesleyan University

### (Abstract)

An examination of the late Frank Collins Baker collection of gastropod mollusks which is located in the Museum of Natural History of the University of Illinois, Urbana, Ill., has resulted in the location of some of the holotypes and paratypes of F. C. Baker. These types are of both Recent and Pleistocene species.

In the collection of Recent species, twenty-nine of Baker's species are represented by holotypes and paratypes. These are included in twelve genera. According to the catalogue of the collection, thirty species or subspecies are represented by paratypes. Twenty of these are of Baker's species. Eight of the lots of paratypes have not been located. These thirty species and subspecies are included in thirteen genera.

In the collection of Pleistocene species, twenty of Baker's species are represented by holotypes and paratypes. These are included in twelve genera. Of Baker's species, eight are represented by paratypes only. These are included in four genera. Two lots, each composed of several specimens, are designated as types.

A further attempt is to be made to locate all of F. C. Baker's holotypes and paratypes. That is to include the types of both gastropod and pelecypod mollusks.

Haas: "Gastropoda, Sphaeriidae, Unionidae—all were present in Baker's material; I presume that much remains to be worked."

Bequaert: "Are you working with the specimens he figured?" Franzen: "Yes; in some cases they have been kept separate, in other instances are so listed in the catalog. A black arrow indicates illustrated specimens, a red one designates a type. However, these markings are not consistent."

Bequaert: "This material will be most valuable when somebody gets around to working up the American freshwater material."

Haas: "We have Baker's Academy of Natural Science material in the Chicago museum which he used in "Mollusca of the Chicago Area." It is in poor shape." Morrison: "Can't it be cleaned and rearranged?" Haas: "Yes, though it will take time. It would be a worthwhile job."

Morrison: "I think some of Baker's types are at the University of Wisconsin. I understand that they are stored, probably intact though certain to be dusty. Some holotypes of his Lymnaeidae and Planorbidae came to the National Museum."

Berry: "Does anybody know where the microscopical material may be; I mean slides of radula and genitalia?" Haas: "I suggest that they are in alcohol somewhere, in material not made up."

During the noontime break everybody seized the opportunity to further explore the beautiful building in which the meeting was being held, and to enjoy the view from the roof terrace. The University of Kansas occupies a hill-top and commands a panorama of a sizable portion of the eastern part of the state. Directly below is the city of Lawrence, and beyond it threads the Kaw river, looking in June quite incapable of the wild spring rampages with which it annually devastates and enriches the countryside through which it flows.

These papers occupied the final afternoon session:

## ADDITIONAL INTRODUCTIONS OF FOREIGN SNAILS INTO ARIZONA

DR. ALBERT R. MEAD

### (Abstract)

The previously reported *Helix aspersa* is extending its range in the Tucson area to gardens of ranches in outlying districts. *Rumina decollata*, earlier reported from Mesa, has recently been found established in Phoenix. *Limax flavus* still continues to be the most commonly encountered foreign mollusk in Arizona. One collection of several dozen slugs in a Tucson garden yielded two specimens of *Limax poirieri* Mahille (=*L. marginatus* auct.). Also found in Tucson was a thriving population of the pale, buff-tan form of *Deroceras laeve* introduced on nursery stock from the San Francisco Bay area. This is in contrast to the endemic gray-black form in the Arizona mountains.

A Tucson high school teacher brought in a large snail which had been found "on a bunch of bananas from South America" in July 1952 in Greeley, Colorado. A few weeks later it was taken to Tucson and kept alive as a pet until May 1953. It was identified as *Porphyrobaphe* (Or-

thalicinae). Dr. Bequaert further identified it as *P. iostoma* Sowerby, endemic in the tropical lowlands of Ecuador and Peru.

These records have been encountered only incidentally. Others will be found. In spite of the extremes in temperature, areas under cultivation in Arizona afford a surprisingly suitable environment for introduced gastropods.

As he completed his remarks, Dr. Mead displayed the shell of *Porphyrobaphe iostoma* Sow. of which he had just spoken. Leonard: "Many of the local cellars are walled with imported limestone; we are constantly getting specimens of *Limax maximus* and *L. flavus* for identification." Mead: "*L. maximus* has not as yet turned up in Arizona; it is not difficult to predict that it will be found there before long."

## 'PARAGONIMIASIS IN THE BRITISH CAMEROONS'

DR. ELMER G. BERRY

*Paragonimus*, a parasitic lung fluke, produces in the host (a human and certain other animals) a chronic cough; eggs from this fluke are present in rusty-colored sputum, and if expelled into streams under favorable conditions may encyst in the bodies of certain snails (a species of *Potadoma*). There developing into sporocysts, they produce numerous cercariae which leave the snail for a third host, this time a crab where they encyst in the muscles. Eating of the infected and insufficiently cooked crab by a human begins completion of the life-cycle of the larval trematode, for it bores through the intestine and migrates along the abdominal wall, bores through the diaphragm to lodge finally again in the lung. That more females than males contract this disease in the area studied is due to an interesting superstition; crabs are supposed to ensure fertility among women, while tadpoles serve a similar purpose for the men!

Lantern slides showing patients with paragonimiasis accompanied this paper, and specimens of the guilty snail were passed for inspection.

## ZOOGEOGRAPHY, SUBFAMILIES AND FAMILIES

DR. JOSEPH P. E. MORRISON  
U. S. National Museum, Washington, D. C.

### (Abstract)

In conducting research on the Subfamily and Family relationships of certain land Mollusks, their zoogeographic distribution has been examined in the search for possible confirmation of zoological divisions of the larger groups which are based on anatomy. The most interesting examples are those in which the zoogeographic story of each division is completely different from that of other divisions within the larger group under study. In these cases I believe that the present differential geographic distribution of certain groups is a direct end-result of their zoologically separate past histories over a span of geologic time.

There are two groups now included in the Urocoptidae that should be separated. The Urocoptidae in general are West Indian in distribution, including some territory on the adjacent continental shores. They have a peculiar type of radula a little different from that of any of the related land snail families. The American mainland group called up to now the subfamily Eucalodiinae have a different radula. In fact they possess some anatomical features including the radula that are almost the same as the

corresponding features of the North American family Polygyridae. The Eucalodiine group includes the *Holospira* complex from southwestern United States and Mexico. The radula is different; the zoogeography is different; it becomes apparent that there is a zoological distinction corroborated by a different history. The one member of the Eucalodiine group that is isolated on the Island of Hispaniola (the genus *Archegocoptis*) only serves to point this genus out as a relict form on Hispaniola, where several other distinct forms are also known as surviving relicts of other families.

In my opinion there are two families, with the zoological distinction separating the Urocoptidae (Pilsbry 1898) and the Eucalodiidae (Crosse & Fischer 1872) confirmed by a different end-result of recent zoogeography in each family.

Another group of Mollusks under consideration is the Cyclophoroid complex of operculate land snails. Anatomical examination of the animals of many of the American genera has shown very clear separations that I believe are of subfamily rank. The subfamily Neopupinae (Kobelt & Moellendorff 1898) possesses in the males a simple tapered verge on the right side of the neck, traversed by an open seminal groove only. This group is primarily North Caribbean or Greater Antillean in distribution, perhaps also in origin. It includes *Aperostoma* (Mexico), *Tomocyclus* (Guatemala), *Farcimen* (Cuba), *Farcimoides* (Hispaniola), *Neopupina* (Puerto Rico), and *Megalomastoma* (Puerto Rico and the Virgin Islands).

The subfamily Neocyclotinae (Kobelt & Moellendorff 1898) possesses in the males a verge dorsally attached, traversed only by a seminal groove, but with a specialized terminal appendage. If we look at the zoogeography of this group we find a most interesting story. This is the only group of Cyclophoroid snails known to be living on the Island of Jamaica. On Jamaica, there are ten genera in this subfamily. Of these ten genera, some have been living on Jamaica, without generic change of distinctive shell characters, since the Miocene Era. Species that belong to two of the modern (living) genera of Jamaican Neocyclotinae were fossilized in the (Miocene) Bowden Beds. If we look for the rest of the Neocyclotinae we find that the only genus on Grand Cayman Island (*Cyclocaymania*) is obviously a derivative of *Cyclopilsbrya* from the northwest portion of Jamaica. All the other extra-jamaican Neocyclotinae known are most closely related to *Cycladamsia* from western Jamaica. The mainland genera *Neocyclotus*, *Cyclohidalgua*, and *Incidostoma*, all have the same type of operculum as does *Cycladamsia*. I believe we have geographic indications here of the Jamaican origin of the Neocyclotinae, as well as proof that it is an old group with at least two Jamaican genera unmodified since the Miocene. One type has spread and/or survived on the mainland as far north as Mexico and south and east across tropical South America and up the Lesser Antillean Chain as far as St. Vincent. These two American subfamilies, with the typical one, the Cyclophorinae, are closely related to the marine family Littorinidae, which also possesses in the males a verge with only a seminal groove.

A third American group, the Amphicyclotinae, with a different zoogeographic picture is closely related not to the Cyclophorids but to the marine family Lacunidae. These two, the Lacunidae and the Amphicyclotidae (here elevated to family status) possess a completely tubular verge, traversed by a vas deferens throughout. The zoogeography of the Amphicyclotidae is simpler, with several small genera, each with limited

distribution. They are known from Mexico, Central and South America, and up the Antillean Chain as far as the eastern mountains (Sierra Maestra) of Cuba. They are completely missing from Jamaica. The opercula of the Amphicyclotidae vary in the different genera from wholly corneous to almost completely calcified as in the genera *Crocidopoma* and *Cyclocubana*. The amount and/or pattern of calcification of the opercula of the Amphicyclotidae is only a generic character, but is very characteristic for each genus.

In this land operculate case also, there are two groups that should be considered separate families. Here the observed anatomical differences that so clearly relate each of the two to a different marine family are corroborated in my opinion by the differences of zoogeography of the families Cyclophoridae and Amphicyclotidae.

Mead: Have radula studies been made? Ans.: In the case of the Urocoptid—Eucalodiid complex the radula is one of the principal characters of distinction. In the case of the Cyclophoroid complex the radular distinctions are almost valueless. Separate genera of each of the two families have radulae that differ only in the number of cusps (always 2 or 3) on the outer marginal tooth. In both cases our radular studies have included every genus of which there was either preserved or dried material available.

Abbott: Were all these different kinds of Cyclophorids recognized by Dr. Bartsch in his monograph on the West Indian species? Ans.: Yes. The difference is that this new subfamily and family arrangement of mine is based fundamentally on animal characters.

Bequaert: Are these generic findings based on opercular difference only? Ans.: No. In every case there are shell and animal differences that also serve to identify the generic groups.

Mead: Have you made histological studies of the verge in all cases? Ans.: Histological studies have not been made. All my conclusions are based on visible external gross anatomy.

Berry: Is this seminal groove visible? Ans.: Yes, this groove is readily located on the surface of the verge, even when its borders are closely appressed to form a functional tube.

Abbott: Do I understand this structurally open groove simulates a tube in its function? Ans.: Yes. This groove apparently functions as a tube that is not sealed along one seam.

Mead: Such structures deserve considerable study, especially as to their process of development.

Haas: To return to the history of these shells—when did these genera appear? Ans.: I believe these genera developed a long time back. However, we have only the proof that two living Jamaican genera have not changed their shells since the Miocene.

Haas: Was Jamaica isolated during the Miocene? Ans.: I don't know the details of this geological history like the geologists do, but I believe it was. Certainly these particular fossils indicate to me that it was.

Leonard: Is each of these types represented by a number of species? Ans.: Yes indeed. Some genera have as many as 20 or 30 species; others but 2 or 3. I believe only 3 or 4 of all the American genera of Cyclophoroids are limited to one known species.

Leonard: What are or were the mechanisms of isolation on Jamaica? Ans.: Natural barriers such as river valleys, mountain blocks, and different soils, acting over long periods of time. These particular snails seem to be

rather colonial, that is the populations tend to remain in a restricted area. This tendency may also have been made more effective by the deep leaf-mold or even burrowing habit of many of these species of land operculates.

## SPECIATION AND EVOLUTIONARY TRENDS IN THE NEW ORDER CLIPPOIDEA

R. TUCKER ABBOTT

U. S. National Museum, Washington, D. C.

Mr. Abbott gave a humorous, illustrated talk on a pseudo-scientific subject. It was a satire on modern species concepts and nomenclature based entirely upon a binomial classification of ninety species and seven genera of paper clips—hence, the new order, Clippoidea.

## DEMONSTRATION OF THE EGG-MASSES AND EGGS OF DETRACIA FLORIDANA (PFEIFFER)

DR. JOSEPH P. E. MORRISON

U. S. National Museum, Washington, D. C.

### (Abstract)

These salt-marsh snails were collected, *with their eggs for the first time*, on June 7, 1953, from the muddy and swampy margin of one of the small estuaries tributary to Chesapeake Bay at Deale, Anne Arundel Co., Maryland. At first it seemed impossible to prove that the eggs and microscopic shelled larvae emerging therefrom really belonged to *Detracia*. These embryonic larval shells were much smaller than the uneroded apex (nuclear whorl) of the youngest *Detracia* shells on hand for comparison. However, after about two weeks time had elapsed, the living adult *Detracia* snails very obligingly laid a fresh batch of egg masses of identical type in a dish in the Museum laboratory, just in time for them to be rushed to the annual meeting of the American Malacological Union.

In spite of the fact that this material had partly dried up from excessive heat in the trunk of the car on the way to Kansas, there was enough remaining for a visual demonstration. The adult snails (deceased by then) and the tiny detritus-covered egg masses were readily seen under the binocular microscope. The somewhat irregular, low, domed or sub-hemisphaerically shaped egg masses are about 3 mm. in diameter. Each contains 20 to 50 or more regularly elliptic-ovate eggs of microscopic size (about 250 microns or  $\frac{1}{4}$  mm. long) more or less equally interspersed throughout the transparent jelly of the egg mass. There is apparently no outer membrane; the detritus particles adhere to the jelly surface, affording a natural camouflage to hide the eggs from predators' eyes. This detritus covering must be scraped away, or the egg mass ripped open, before the oval egg capsules and the contained eggs or developing larvae may be seen clearly.

To my knowledge, this is the first time the eggs of any member of the family Ellobiidae have ever been discovered and scientifically recorded. The suspicions regarding the life history expressed in 1950 (American Malacological Union News Bulletin and Annual Report for 1950, pp. 8-10) are confirmed by these discoveries. The larvae of *Detracia floridana* swim from the egg, to pass through a pelagic stage of growth, before beginning adult life. This pelagic stage of the life history does account for the sys-

trophic nucleus of the adult shell, as well as for the wide geographic distribution made possible and/or maintained by the scattering of the pelagic young in the plankton of the (brackish) estuary waters to all ecologically suitable shorelines.

The final paper was read early in the afternoon, so delegates accepted the invitation of Dr. E. R. Hall, Director of the Museum of Natural History, University of Kansas, to visit the museum. There they were conducted on a behind-the-scenes tour, first admiring the two floors of natural history exhibits which are ranged about the huge, semi-circular diorama which occupies most of the foyer. Inspecting the workrooms where exhibits are prepared, those accustomed to the usual clutter of museum morgues and workshops were impressed with the white-tiled, spic-and-span laboratories where Dr. Hall and his staff carry on their work.

Leaving the museum with an hour to spare, the delegates in a body enjoyed the hospitality of Dr. and Mrs. Leonard in their charming home, then re-convened at eight o'clock in the Sunflower Room of the now-familiar Student's Union Building. There, with Dr. and Mrs. Hall as guests, was enjoyed the annual dinner. An excellent meal of Kansas beef was enlivened by the reading at intervals of pseudo-telegrams, supposedly from absent members, and by brief remarks by several members of the party.

The evening was made complete by an hour-long film showing all phases of Japanese pearl culture, presented by Dr. A. Myra Keen who supplied explanations in lieu of sound or printed titles, since it had been filmed for Japanese presentation. Dr. Keen left immediately afterward for Colorado Springs, there to vacation for a few days before returning to Stanford.

Several other delegates made their departure on Saturday morning; still, the field trip numbered an even dozen, and those attending reported a most enjoyable day. Traveling in several cars to the Marais des Cyne river southeast of Lawrence, the party enjoyed a picnic lunch and fair collecting in view of the fact that the season had been unusually dry. One of the ladies discovered a copperhead snake which was captured by Dr. Morrison and which accompanied him back to the National Museum.

And so concluded the nineteenth annual meeting. There will be bigger meetings in the years to come, but they will never be better.

MARGARET C. TESKEY, Secretary

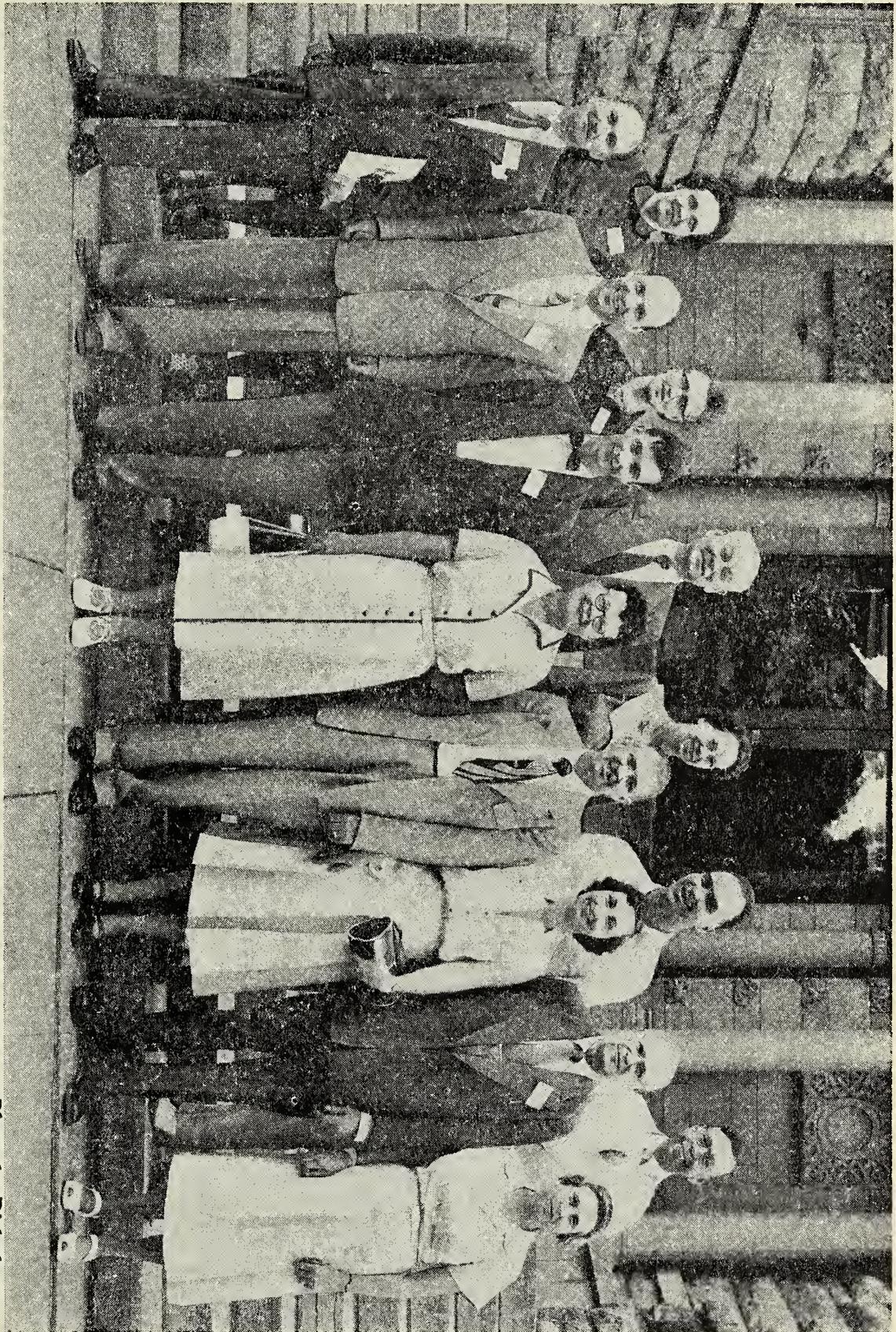
## REGISTRATION, NINETEENTH ANNUAL MEETING

- Mr. R. Tucker Abbott, U. S. National Museum, Washington, D. C.  
Dr. Joseph C. Bequaert, Museum of Comp. Zoology, Cambridge, Mass.  
Dr. and Mrs. Elmer G. Berry, National Institutes of Health, Bethesda, Md.  
Miss Verna Fowler, Salina, Kansas  
Dr. Dorothea Franzen, Illinois Wesleyan University, Bloomington, Ill.  
Dr. Fritz Haas, Chicago Natural History Museum, Chicago, Ill.  
Dr. A. Myra Keen, Stanford University, Stanford, California  
Dr. and Mrs. A. Byron Leonard, University of Kansas, Lawrence, Kansas  
Dr. Albert R. Mead, University of Arizona, Tucson, Arizona  
Dr. Joseph P. E. Morrison, U. S. National Museum, Washington, D. C.  
Mr. and Mrs. Dan W. Ott, Salina, Kansas  
Dr. Juán José Parodiz, Carnegie Museum, Pittsburgh, Pa.  
Dr. Jeanne S. Schwengel, Scarsdale, N. Y.  
Mrs. Margaret C. Teskey, Buffalo, N. Y.

## Delegates Present at the Nineteenth Annual Meeting

*Photo by D'Ambra*

First row, left to right: Dr. Juan Jose Parodiz, Dr. Albert R. Mead, Mr. R. Tucker Abbott, Dr. Jeanne S. Schwengel, Dr. A. Byron Leonard, Mrs. A. Byron Leonard, Dr. Fritz Haas, Mrs. Elmer G. Berry.  
Second row: Dr. Dorthea Franzen, Mrs. Margaret C. Teskey, Dr. Joseph C. Bequaert, Dr. A. Myra Keen, Dr. Joseph P. E. Morrison, Dr. Elmer G. Berry.



## THE AMERICAN MALACOLOGICAL UNION PACIFIC DIVISION

### Minutes of the Sixth Annual Meeting Held at Asilomar, Pacific Grove, California

JUNE 12-13, 1953

The meeting was called to order by chairman Allyn G. Smith at 9:30 A. M. on Friday, June 12th, 1953. After a few words of greetings, a fellow collector from far off Honolulu, Jens Ostergaard, was presented to the group. Ruth Coats, as program chairman, next outlined the procedure to be used in the presentation of papers.

Chairman Smith appointed Leo Hertlein, Myra Keen, John Q. Burch, Andrew Sorenson and Joshua Bailey as a nominating committee. Communications were read from Lee Miles and Mrs. Frank MacFarland, expressing their sorrow in not being able to attend the meetings.

The first paper, "MOLLUSCAN PREDATORS AND THEIR PREY," was presented by Hazel Whelchel, having been written by the team of Sorenson, Strohbeen and Whelchel. Much discussion followed.

#### (Abstract)

Most of the marine gastropods are predators, that is, they are carnivorous. *Haliotis* and *Acmaeas* are the chief exceptions for they are strictly vegetable feeders. On the other hand the pelycepods feed mostly on plankton and detritus.

The Polinices bring clams out of the sand and drill holes through the shell near the hinge, and thus are able to eat the clam. The Murexes likewise bring up the clams, but they positively never drill; they file a narrow opening where the two valves are thinnest. The so-called oyster drills, perhaps the most destructive of them all, *Urosalpinx cinereus*, has done immense damage on the east coast. From there it has been introduced to the San Francisco Bay and Humboldt County oyster beds. Another drill, *Eupleura muriciformis*, is found in the Gulf of California.

The greatest predator of all is MAN. He upsets the balance of nature by taking more than he needs, so causing many species to become extinct, or nearly so. See what the fishing industry has done to the sardines and abalones on the California coast! IT DOESN'T PAY TO KILL THE GOOSE THAT LAYS THE GOLDEN EGG.

The second paper, "RESURGENT POPULATIONS OF THE BEAN CLAM, DONAX-GOULDII DALL," by Wesley R. Coe of Scripps Institution of Oceanography, La Jolla, California, was read by Merton Hinshaw. This clam has presented an unusual condition which even today is unsolved. The sudden appearance of vast populations—and the equally sudden disappearance has caused great concern to the students of malacology. Several of those present told of seeing strips several yards wide—and as far as the eye could see of this clam on the Southern California beaches.

(Abstract)

On sandy beaches in various parts of the world species of the little bean-clam *Donax* are noted for their sudden appearance in vast populations followed after one to three years by an equally rapid disappearance. A satisfactory explanation for this phenomenon has hitherto not been found. Such resurgent populations of *Donax gouldi* Dall have appeared at La Jolla on the coast of southern California six times during the present century. On the latest occasion, in 1949, the population of that species increased from an average of less than one individual per square meter to more than 20,000 per square meter within a few weeks and extended in favorable situations for more than five miles along the sandy beaches.

This enormous number of individuals presumably originated from a breeding population eleven miles distant, the pelagic larvae being brought by ocean currents to the beach at La Jolla at the exact time when they were ready to transform to the adult condition and settle in the sand.

At the end of three years virtually the entire population, including also the younger year-classes, was dead, apparently as the result of an epidemic disease caused by a minute parasite, the precise nature of which has not been determined. Not a dozen individuals could be found on the beaches which were occupied a few weeks previously by so many millions.

Chester Wong, of the School of Tropical and Preventive Medicine, Loma Linda, California, presented a paper, prepared by himself, Lois W. Wong and Edward D. Wagner, and entitled "OBSERVATIONS ON THE REPRODUCTION OF *ONCOMEMLANIA NOSOPHORA*, THE INTERMEDIATE HOST OF *SCHISTOSOMA JAPONICUM*." A colored film showed the many steps taken to reproduce this small snail. A lively discussion and question period followed.

(Abstract)

Since Fujinami (1909), Miyagawa (1912, 1913), and Miyari and Suzuki (1913, 1914) worked out the life cycle of *Schistosoma japonicum*, the effective control of the intermediate host, *Oncomelania nosophora* has been a problem. The fact that these snails are amphibious, operculate, and capable of withstanding dessication for long periods of time has complicated efforts to destroy them. Control measures such as chemical molluscicides and live steam have been used in some countries with varying degrees of success, where the snails were located in rather circumscribed areas. However, where the snail population is widespread such measures as are now available are not effective.

New approaches to the problem are thus necessary. Because little information has been accumulated on the life habits of the snail, there is a scarcity of knowledge on which to base any valid conclusions relative to better methods of control. With this in mind, a project aimed at the study of the basic biology of *Oncomelania* was initiated at the School of Tropical and Preventive Medicine in July 1952.\*

*Oncomelania nosophora* from Japan was used in the following experiments. Attempts were made to determine the optimum rearing and breeding conditions of the snails. Various types of habitat, temperature, and light exposure were employed.

The snail containers used consisted of aquaria, porous clay saucers, and petri dishes of several sizes. Habitats were arranged in these containers with varying proportions of soil, water, and bricks. The containers were then placed in rooms where temperatures were maintained at different levels.

Some snails were exposed to continuous light while others were given shorter periods of light.

Attempts were also made to see whether a drop in temperature triggered the reproductive mechanism, since the reproduction of *Oncocelania nosophora* occurs normally in the Spring.

Although the experiments were initiated in the fall of 1952 it was not until January of 1953 that young snails were observed. Copulation of snails had rarely been observed although many young snails are now to be found. The eggs are laid singly on leaves and on the rough surface of brick chips. They are usually covered with a coating of mud which makes them very difficult to distinguish from their surroundings. Eggs average 0.7 mm. in diameter. Newly hatched snails measure approximately 0.8 mm. with a shell of 1.5 whorls. Within three months the snails have increased to 7 mm. with 5.5 to 6.0 whorls. Adult snails average 8 mm. in size with 8 to 9 whorls, the larger snails being females.

Conclusions that may be drawn from results thus far obtained are listed below:

1. Reproduction occurred at the highest rate in saucers exposed to continuous light and kept at 26°C.
2. Containers exposed to continuous light produced more young and at an earlier date than those exposed to 10 hours of light per day.
3. Young snails develop faster when kept at 32°C than at 26°C or 20°C.

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\*This project was supported by a contract between the School of Tropical and Preventive Medicine, College of Medical Evangelists, and the Research and Development Board, Office of the Surgeon General, Department of the Army.

Robert Robertson, of Stanford University, next presented his paper entitled "COLLECTING MARINE SHELLS IN TAHITI." Mr. Robertson had many beautiful specimens on display.

#### (Abstract)

Seven months' collecting in Tahiti and in some of the nearby islands resulted in a collection of about 500 species, more than had previously been recorded in this area. Relative to the western Pacific, there are few species in Tahiti, for the further one goes east in the Pacific, the fewer species there are until one reaches the Marquesas, where probably not more than 150 species can be found. The nearby Tuamotus, however, have a surprisingly rich fauna and constitute an exception.

Gastropod families with the largest number of species recorded in French Polynesia (according to a census of the literature and the present collection) are Mitridae, with 138; Conidae, with 64; Cypraeidae, with 59; and Thaisidae, with 43. In contrast, the largest of the pelecypod families (Tellinidae) has only 15 species, reflecting the disproportionately small number of pelecypod species in Polynesia.

An unusual presentation was next on the program, a color film accompanied by a tape recording: "CHLAMYDOCONCHA ORCUTTI DALL," by Myrtle E. Johnson. This clam while considered rare has been collected by a number of those present in the Mission Bay Area.

#### (Abstract)

*Chlamydoconcha orcutti* Dall, a mollusk reported only rarely at points near San Diego, Santa Barbara and Monterey Bay has internal valves, a mantle that covers the body except for openings for the foot (with its

byssus gland) and for the water current. The internal organs are similar to those of other clams. A short motion picture shows the movement of living specimens in the aquarium. The two specimens were maintained for several weeks in the laboratory on a diet of living plankton. Four references that mention *C. orcutti* are listed.

"A QUART OF SONORAN SAND," by S. Stillman Berry, was a departure from the previous offerings. Here we find at least one hundred thirty-one species in this small volume of sand.

(Abstract)

A quart of siftings taken at Punta Colorado, Sonora, in Jan., 1951, by Richard Long, has proved to be of noteworthy richness and interest. Preliminary examination has revealed more than 1476 individual specimens referable to at least 131 species, including 19 pelecypods, 6 chitons, 90 or more prosobranchs, 14 opisthobranchs (inclusive of the Pyramidellids), and 2 pulmonates. Most abundantly represented species are an *Eulithidium* (196), a *Caecum* (178), and a *Barleeia* (109). The occurrence of *Schismope* in considerable numbers is noteworthy. There is an especially rich speciation of Caecids and Vitrinellids. Several undescribed species are to be dealt with in the detailed report on the material now nearing completion.

This concluded the morning session.

At 1:30 P. M. we again assembled, and the first paper was by Jens Ostergaard of Honolulu, "BIOLOGY OF THE CYPRAEA." This family we have all admired but have had little experience with. The speaker told of the interesting "nesting" habits and disproved the story that a Cypraea could dissolve its shell.

(Abstract)

This group comprises about 200 now-living species and sub-species. Fossil forms may be traced back to the Triassic period. Many extinct forms have been described from the Tertiary of America, and many recent species have been found as fossils in the Pleistocene of Hawaii and Tonga.

The sexes are separate, but no sex difference has been detected in the shell.

Peculiarities are found in species of isolated geographical areas: South Africa, South Australia, Northwest Africa, Hawaii.

Hawaii has about 20% endemic species whose relationship may be traced to other species.

Finally, *Cypraea* lays eggs, then protects them by sitting on them until they hatch, like a hen on her nest.

"HETEROPODS COLLECTED ON THE PACIFIC COAST," by A. D. Howard, was read by Ralph O. Fox. This unusual animal is quite rare on our "Pacific Coast" but discussion revealed vast numbers are eaten by whales in the Arctic. They are difficult to preserve, formalin causing the shells to soften. A preserved specimen can be seen in the Pacific Grove Museum.

(Abstract)

Dr. Garth of the Hancock Foundation, knowing of my interest in Pteropods, called my attention to the collection of some Heteropods brought in this spring by the *Velero IV*. Not having seen this comparatively rare mollusk, I hastened to look up the collection and examine them.

There was one complete specimen with the shell, and three or four individuals somewhat fragmentary. The whole body of these mollusk are transparent like a Medusa (jelly fish) and the animals are pelagic or free swimming in the open ocean. Apparently they depend on their transparency for protection.

These specimens were captured by dipping from a skiff in two fathoms of water in 4th of July Cove, Santa Catalina Island.

Mr. Fred Ziesenhenne found the large perfect specimen lying on the kelp. The species is (tentatively) *Carinaria Lamarcki* Lesveur, which is identical with a species found in the Atlantic, Mediterranean and Pacific. Two collections recorded by the Dana Expeditions' World Cruise in the Pacific were taken considerable distance from land (Eastern Pacific). I have heard of Heteropods being taken by the Laboratory at La Jolla, but have not the record at hand.

The species has a clear gelatinous body about 4 or 5 inches long. The shell is too small (5 mm. high) to enclose the animal but the relatively small gills lie beneath it. The "foot is modified to act as a swimming organ"; it is laterally compressed and is "characterized by a sucker". An elongated body possesses an anterior mouth followed by a central portion bearing the shell and foot and posteriorly a laterally compressed tail.

Dr. J. J. Tesch has described in detail the Heteropods collected on the Dana Expedition.

H. G. Orcutt, Marine Biologist of the California Dept. of Fish and Game, spoke on "OYSTER CULTURE IN CALIFORNIA." Several types of culture used—pond, raft, rock and tide flat were mentioned. He told of natural and introduced pests that attack the young, also of the effect of water temperature on natural reproduction. He also spoke on the introduction of *Corbicula fluminea* Muller into the San Francisco bay area and the spreading of it through the inland waters. Considerable discussion followed, for oyster culture was a thriving business industry in past years. This paper was accompanied by Kodachrome slides.

#### (Abstract)

Oyster culture represents one of the most highly developed marine fisheries. It has been undertaken in many parts of the world and dates back hundreds of years and has developed along divergent lines—such as raft culture, pond culture, rack culture, and tide flat culture as is carried out in California.

The California industry is primarily one of intensive cultivation of imported oysters on privately owned or allotted State water bottoms. The industry may be called "aquaculture", paralleling agriculture in that seed is planted and growing oysters are cultivated and fattened for harvesting. Aquaculture of oysters is dependent upon a successful spawning of oysters, so that small free swimming larvae are produced in abundance. Then the actual culturing can begin.

The first requirement is the provision of cultch, with clean, hard surfaces, such as oyster shells, upon which the larvae can attach themselves at the termination of their free swimming stage of life. Next, the young oysters attached to shells must be placed in satisfactory growing conditions. In California they are usually planted on tidal areas exposed at low tide. These bottoms must be relatively firm to prevent too much sinking in and loss of oysters. Pacific oysters, the oyster primarily cultured in California, when attached to large shells, will do well on mud flats too soft for separate

small oysters. These areas planted must not be subject to strong currents or wave action, for the oysters will be washed away or piled in rows over the beds.

After a growing period on the grounds where planted, the oysters many times need to be fattened for marketing. This necessitates supplying the oysters with an abundance of planktonic food, so that growth may be rapid and fat oyster meats are produced. This involves the scattering of individual oysters and breaking large clusters to eliminate high competition for food and misshapen shells from crowding. Frequently, transplanting of the oysters to deeper water is necessary. As yet, fattening areas can be determined only by trial and error, for areas once satisfactory have been known to become unproductive.

In California when oysters are large enough for marketing, they are gathered by hand picking or tonging. Marketable size is obtained in one and a half to two years. In the case of the imported Pacific oyster, the cultching phase of the collecting of the young seed oysters is accomplished by the Japanese.

Let us now, with the aid of Kodachromes, go over some of the details and problems concerning the production of Pacific oysters from seed produced in Japan.

The first series of slides show the collection of seed oysters in Japan and the preparation of the seed for export to the West Coast of America. A stateside inspection of shipments is made to lessen chances of importation of oyster drilling snails. The actual cultural practices in California bays are illustrated by another series of color projections. The final group of slides illustrate the oyster pests and their damage. The principal damage to oysters is caused by oyster drilling snails, stingrays, crabs, and smothering carpets of green algae.

S. Stillman Berry presented "A TERRESTRIAL MOLLUSCAN FAUNULE FROM THE MIOCENE OF MONTANA" as the concluding paper of the afternoon, reporting on an area well known for vertebrate remains.

#### (Abstract)

The "Deep River" Beds of the Smith River Valley, northwest of White Sulphur Springs, Montana, have been known since the time of Cope for their rich and well preserved vertebrate remains. It has, however, been generally overlooked or ignored that an appreciable molluscan component is also involved. Species worked out to date are approximately 18 in number, referable to 12 genera. All are of terrestrial habit. Except for two species and genera which appear no longer to be extant, the faunule is remarkable modern in general aspect, recalling elements of the fauna now inhabiting this same region as well as that of the Mississippi-Ohio Valleys and the upper Gulf states. Genera represented include *Oreohelix*, *Stenotrema*, *Triodopsis* (or a group closely akin to it), *Discus*, *Anguispira*, *Vallonia*, *Vertigo*, *Succinea* (s.l.), and the prosobranch *Hendersonia*. This assemblage thus tends somewhat to bridge the existing distributional gap between the Idaho-western Montana "island" and the large mother-area to the southeast.

Friday evening at 8 P. M. the Directors of the Pacific Grove Museum of Natural History held open house for the group. At the conclusion of our visit refreshments were served. Then we moved on to Andy Sorensen's home to view his fine collection, an evening long to be remembered.

Saturday morning at 9 A. M. Chairman Smith again called the meeting to order. A telegram was read from Mrs. Teskey of the Parent Organization. He then introduced Myra Keen of Stanford University who spoke on "A CRITIQUE OF DR. J. BROOKES KNIGHT'S PAPER, 'PRIMITIVE FOSSIL GASTROPODS AND THEIR BEARING ON GASTROPOD CLASSIFICATION'." Again that problem—Zoology vs. Paleontology. Much lively discussion followed—need for more research and more complete papers to be printed.

#### (Abstract)

In this paper (Smithsonian Miscellaneous Collections, vol. 117, no. 13, 56 pp., 2 pls., 1952), Dr. Knight attempts to knit together many hitherto uncoordinated observations of neontologists (who know little of the past history of life but who do have a detailed knowledge of molluscan anatomy), and paleontologists—who know little of the internal aspect of Mollusca but who do know something about the order of appearance of the various groups in time. After considering the developmental history of modern forms, he draws inferences as to the probable anatomical arrangement of ancient stocks. He shows, for example, that although the earliest gastropods were limpet-like in form, modern limpets are not their direct descendants. Few modern stocks can be traced into the early Paleozoic, in fact. The most revolutionary hypothesis Dr. Knight advances is that the chitons are offshoots of certain early limpet-like gastropods in which the several pairs of muscle scars led to separation of the single valve into eight segments. This seems rather startling. However, the presence of chiton-like fossils in the very early Paleozoic lends some support, for it is thus evident that the chitons are an ancient stock, whether descended from some gastropod ancestral strain or more directly from the undifferentiated primitive mollusk. Were Dr. Knight's hypothesis accepted, it would mean reduction of the phylum Mollusca to four classes, with the chitons or Amphineura falling as a subclass, the Polyplacophora, under Gastropoda.

Allyn G. Smith read a paper by Yoshio Kondo, of the Bishop Museum of Honolulu, entitled "THE DISTRIBUTION OF PARTULA GIBBA FERUSSAC," wherein Mr. Kondo followed the movement of this species through the Marianas Islands.

#### (Abstract)

The distribution of the tree snail *Partula gibba* Féruccac on the principal islands of the southern Marianas Islands, namely Guam, Rota, Tinian, and Saipan has been known for many years but its existence in the smaller islands of the northern Marianas such as Anatahan, Alamagan, Pagan, and Agrigan was speculative. Because of its logical distribution in the south, Dr. C. Montague Cooke believed there was a strong possibility that the species extended northward. His belief was confirmed in 1949 when the species was collected on Alamagan and Pagan which indicates that, of the remaining eight islands, four should harbor the species while four remain doubtful. Though the nearby Bonin Islands are suitable, *P. gibba* has not gained foothold there.

In 1952 the existence of *Partula gibba* and a derivative of it were discovered. This derivative is much smaller than the normal parental stock, is uniformly colored deep purplish-brown in combination with a lighter subsutural zonation and a fulvous apex. An average specimen measures 15 x 10 mm., with 5 whorls. Since no cross-breeding is evident between the two forms, it is hypothesized that this "dwarf" form has at-

tained a near-species status, and may be a later migrant to this island. Its ancestor probably came from Rota on which island there is a race of *gibba* characterized by a multicolorous conglomeration of many-sized shells.

On Saipan is a sinistral mutant of *P. gibba*, chiefly centered around Mt. Tapochau. First collected by Bennigsen at an unknown date, it has since 1945 been collected by Langford, Abbott, and others. The ratio of dextral to sinistral varies from 9.9 percent to 18.5, depending upon the collector, the exact location, and other factors.

A nearly parallel instance of similar distribution is shown by *Partula hyalina* Broderip which inhabits some of the islands of the Society and Cook Groups and all of the Australs except Rapa.

"THE UNIVERSAL CONCHOLOGIST—THOMAS MARTYN" was the title of a paper presented by Emery Chace. It was a timely paper for three members had brought their copies of this famous publication: the speaker, Ruth Coats and S. Stillman Berry. This custom-bound publication is quite variable, for the Chace copy had 69 plates, the Coats copy 80 plates, while the Berry copy had 81 plates. John Q. Burch stated that the copy owned by the King of Italy—especially bound, etc., was for sale at \$1,000.00.

#### (Abstract)

A digest of most of the available notes that have been published about this rare book of colored plates of shell illustrations. Some notes about the three copies of "The Universal Conchologist" that were brought to the meeting so that those present could examine them. A statement about the publication and sale of this work. It appears to the writer that it was largely a custom made book and not a publication in the present-day use of that term and as such is not available as a source of acceptable names in Conchology. However, the writer expressed his opinion that it would create less confusion to accept the Martyn names than it would to rule them all out.

V. D. P. Spicer spoke on "SHELL COLLECTING ON MIDWAY ISLAND," an account of his personal collecting during the days of World War II, while serving with the U. S. Navy. This concluded the morning presentations.

#### (Abstract)

#### (Briefed by Secretary)

Midway atoll is a typical coral ring atoll, about seven miles in diameter. Within the lagoon close to the reef on the southwest side are two low sand islands each about a square mile in area. Between them a ship channel has been dredged. On the northwest the reef has been elevated a few feet above sea level and has been much sculptured by wind and spray. Within the reef, the large lagoon is mostly sandy bottomed, varying from deep to shallow, and dotted with coral heads which approach the surface.

This collecting record represents not only my own efforts but that of several thousand men confined to a couple of square miles of dry land and twenty-five square miles of reef and lagoon, with no other recreation or amusement available.

A rock crusher used to break up coral heads for construction projects was the source of many choice finds.

*Cypraea* was probably the most numerous both as to species and individuals, with *Conus* second.

The Saturday afternoon session began with William K. Emerson of the Museum of Paleontology, University of California, presenting his paper, NEO-ECOLOGY, PALEOECOLOGY AND MARINE MOLLUSKS. Here again is stressed the need for closer cooperation between the workers—and the need for more complete publications.

(Abstract)

Unlike the neo-ecologist, the paleoecologist is required, because of the limitations of the fossil record, to evaluate on a purely interpretive basis the ecological factors under which fossil organisms lived. It must be assumed that conditions which existed at the time the fossils were living are comparable to those under which the same or similar organisms are found living today. This assumption, being based upon the Law of Uniformitarianism, i.e. that the "present is the key to the past," and that conditions responsible for former biological and geological phenomena are essentially the same as those prevailing today, is the paleontologist's primary tool for ecologic interpretations.

In evaluating a fossil assemblage, the paleoecologist is restricted by the nature of the fossil record to those elements of the original fauna which possess preservable remains. Unfortunately, a natural assemblage of the preservable constituents of a fauna is seldom found; instead, a death assemblage (thanatocoenose), representing not only a portion of the organisms living in the depositional environment, but also foreign elements (allochthonous forms) from other environmental sources, is most often encountered. Paleoecologic evaluations must be based upon the faunal elements which reflect the nature of the environment of deposition. Regardless of the incompleteness of the fossil faunule, it has been shown that it is possible to make certain fairly accurate interpretations of the Tertiary record based upon a knowledge of the living organisms, as many Tertiary genera (and species in some cases) have a geologic range extending into the Recent.

In assuming that a fossil assemblage occupied an ecologic niche similar to, if not the same as, that occupied by their extant descendants, certain limitations should be kept in mind. For example, possible changes in physiological tolerances may not be reflected in the morphological features which are available to the paleontologist for evaluation; such changes could affect habitat and distributional requirements, but when a large assemblage substantiates the inference for a single species, it seems highly probable that there has been no significant changes in habitat requirements of that species.

In the Cenozoic, mollusks are very abundant and constitute significant indicators for paleoecologic interpretations. Although the shallow water molluscan fauna of the Pacific Coast of North America and the general distribution of its components are fairly well known, very little information is available concerning the life histories and ecologic requirements of the species. Even less is known regarding the moderate depth and deep water species. Unfortunately, only a small portion of the vast material dredged off the West coast by the *Albatross* and the *Velero III* and *IV* has been worked up. Were these data available by stations, including depth, bottom character, and temperature, a much better insight into the environmental requirements of the critical offshore communities would result.

Recognizing the need for comparative data in order to adequately evaluate the paleoecology of Pleistocene megafaunas of Southern California, Alex Clark undertook by means of dredging operations to survey

the nearshore molluscan communities occurring off Long Beach. Though this investigation was never completed, Clark (1933) briefly recorded the findings in abstract form; these data have been utilized for paleoecologic interpretations of some late Tertiary mega-faunas of California. Keen and Frizzell (1939) have tabulated general ecologic data for some West coast pelecypod genera; Durham (1947) has compiled bathymetric distribution records of 964 gastropod genera occurring in all seas.

A few offshore faunal lists, in which bathymetric and bottom data are recorded, are available to West coast paleontologists; notable among these are: Kelsey (1907) for San Diego, T. and J. Q. Burch (1942; 1943) for Redondo Beach and Del Monte, and Smith and Gordon (1948) for Monterey Bay. While a number of faunal lists representing mainly shallow water species have been compiled for West coast localities, these are of little value in paleoecological studies as only geographical data are generally recorded. The Minutes of the Conchological Club of Southern California provide the most valuable single source of neo-ecological data pertaining to the West coast mollusca. However, considerably more information is to be found scattered in the voluminous West coast molluscan literature; if these records were compiled, they would constitute a valuable aid to the paleoecologist.

In recent years, some intensive ecological studies have been conducted on the West coast, usually in the vicinity of marine stations, e.g. Puget Sound (Shelford, *et al.*, 1925, 1935), Monterey Bay (Hewatt, 1937), and Elkhorn Slough (MacGinitie, 1935). Most of the ecological studies are of little value for paleoecological interpretations as emphasis has been placed upon the recognition of a complex classification of faunal and floral marine communities based upon the primary elements of the populations. Such investigations have usually ignored the totality of the communities and have often neglected habitat tolerances and life history studies. In order to provide the paleontologist with adequate data for paleoecological interpretations, future neo-ecologic investigations should include: (1) a study of the faunal components of the basic environmental types occurring at each locality, (2) a comparison of similar environmental types with those occurring at several geographically isolated localities, and (3) time allowance of sufficient magnitude to reflect the influence of seasonal and cyclic factors (*cf.* Woodring, *et al.*, 1946).

S. Stillman Berry presented his third paper, "ON THE SUPPOSED STENOBATHIC HABITAT OF THE CALIFORNIA MUSSEL," disproving the fact that *Mytilus* is exclusively intertidal by presenting evidence that they may be found much deeper.

#### (Abstract)

The Californian mussel is frequently stated to be exclusively intertidal in habitat, and the occurrence of empty valves in off-shore hauls has even been cited as evidence of recent strong orogenic movement. However, the ease with which these animals may be maintained in well-aerated aquaria for extended periods without benefit of either pounding surf or tidal oscillation might well have prepared us for the ever-increasing discoveries by southern Californian divers of rich beds of this species in suitable areas below tide-level. The recovery by E. P. Chace from the bay dredgings at San Pedro of a fairly fresh valve of this *Mytilus* bearing numerous attached examples of the small deep-water brachiopod *Platydia*, while not in itself conclusive, is of value as evidence. More definitive is

the capture of a very large living individual (long .228 mm.) by the trawler "Winga" in 48 fathoms, S.W. of Seal Rock Light, Humboldt County, California. The presumption is strengthened accordingly that *M. californianus* is very much more eurybathic than has prevailingly been assumed.

Ruth Coats next read a paper prepared by Karl K. Greene of Honolulu, Hawaii, entitled, "THE GENUS CONUS IN THE HAWAIIAN AREA." Here a "scientifically untrained man" (to use his words) has contributed much to the knowledge and range of this genus in the Hawaiian area. A fine series of colored slides illustrated the species described.

(Briefed by Secretary)

I do not think that this could be properly called a Check List of Hawaiian Cones, for there will be considerable discussion concerning some of them, especially where new names are involved, and the so-called "new" cones are given a little additional attention. It also seems wise to inform you of the area covered. This is from Palmyra island on the south to Kure, west of Midway on the northwest. It is generally referred to as the Hawaiian Chain, and believe it or not, both are in the area covered by the City and County of Honolulu.

Hawaiian cone shells: *Conus abbreviatus* Reeve, *C. atramentosus* Reeve, *C. aureus* Brug., *C. bandanus* Brug., *C. catus* Brug., *C. chaldeus* Röding, *C. distans* Brug., *C. ebraeus* L., *C. eugrammatus* Dall, Bartsch & Rehder, *C. flavidus* Lam., *C. halitropus* D., B. & R., *C. hammatus* D., B. & R., *C. imperialis* L., *C. leopardus* Röding, *C. lithoglyphus* Meuschen, *C. lividus* Brug., *C. miles* L., *C. nanus* Brod., *C. nussatella* L., *C. oblitus* Reeve, *C. pennaceus* Born., *C. pertusus* Brug., *C. pulicarius* Brug., *C. quercinus* Brug., *C. rattus* Brug., *C. retifer* Menke, *C. spiceri* D., B. & R., *C. striatus* L., *C. sumatrensis* Brug., *C. tessulatus* Born, *C. textile* L., *C. vitulinus* Brug. The following have been found in Hawaiian waters, but for the most part they are of the "one of a kind" class: *C. bullatus* L., *C. clavus* L., *C. cylindraceus* Brod. & Sow., *C. pulchellus* Swain., *C. sanguinolentus* Q. & G., *C. scabriusculus* Chem., *C. smirna* D., B. & R., *C. tenuistriatus* Sow.

"AN EXCURSION TO LAKE MIRAGOANE, HAITI" was the title of Walter Eyerdam's paper. He told of collecting such as few of us will ever experience.

(Abstract)

This is a brief report on a small collection of highly endemic species of shells, taken in 1927 from a small freshwater lake in Haiti while the author was collecting biological material for the U. S. National Museum and the Museum of Comparative Zoölogy.

Several excursions were made to Lake Miragoane to collect land shells, reptiles and plants, in the company of Dr. Erik Ekman, the Swedish botanist. The freshwater shells were taken on the south side of the lake right after a disagreeable experience of becoming embogged in deep mud.

The lake has been very superficially explored, and at certain seasons it is an aquatic aviary harboring many species of rare and interesting birds. To an experienced and enthusiastic naturalist who is willing to spend several weeks at this spot there is considerable promise of rich return in endemic species of limnological forms of life. Only about three miles in area, it is practically the only fresh-water lake in Haiti.

The shell fauna of Hispaniola is quite interesting, and because of rugged topography there are still many undiscovered races of shells to be found. Then there are large areas where apparently no mollusks occur. The shell fauna of Cuba is several times as great in species and in numbers as is that of Hispaniola.

The freshwater shells collected by the author in Haiti are all at the Museum of Comparative Zoölogy and at the Philadelphia Academy of Sciences.

John Q. Burch read the paper "SENILITY IN HALIOTIDAE" by Robert R. Talmadge. Color slides illustrated this paper and discussion revealed that many present agreed with the findings of Mr. Talmadge.

(Abstracted by the Secretary)

The rate of growth of a *Haliotis* is unknown to the writer. Also unknown is the size that the animal reaches at maturity. However, regardless of size, when a *Haliotis* reaches full maturity, a definite physical change occurs in the shell. The depth of the shell increases, the thickness of the shell becomes two and three fold. The inner nacre becomes pitted and granular, with stains of various shades of brown and black splotching much of the inner surface. As the nacre is built up, the dorsal surface is eroded away, both by marine growth and by borers. In many cases this is so extreme that the entire dorsal surface is destroyed with no trace of the sculpture or normal tumerations. Many aged shells are so eaten away as to resemble a sponge.

"THE MALE FLAPJACK DEVILFISH" was the subject of a paper by S. Stillman Berry. With the original description based on the female alone, many new features were revealed.

(Abstract)

*Opisthoteuthis californiana* was described in 1949 from females alone. The capture of an immature female and an adult male in 280 fathoms, off Humboldt County, California, by R. B. McCormick of the California Department of Fish and Game, now reveals the peculiarities of the previously unknown male. In the female all suckers are small. In the male 8 to 10 of the more proximal suckers (though not the sucker nearest the mouth) on each arm are enormously enlarged, massive, globular, and closely packed. Succeeding suckers are small on all arms except the dorsal pair, each of which abruptly bears a second group of about 6 massive and enormous suckers distally just beyond the umbrella margin, greatly distorting the arm at this point, although the latter terminates in a minute and slender tip.

The concluding presentation was by Leo G. Hertlein, his subject being "OCENEBRA ERINACEOIDES AND ALLIED SPECIES." Discussion followed.

(Abstract)

Three specific names applied to tropical west American species of *Ocenebra* are considered here. These, in order of their appearance, are *Murex erinaceoides* Valenciennes, described at least as early as May, 1832, from Acapulco, Mexico; *Murex lugubris* Broderip, January 14, 1833, from Puerto Portrero, Costa Rica; *Murex californicus* Hinds, 1844, from "California."

These names appear to be applicable to two forms, a southern shell with a comparatively low spire and a more northern one with a comparatively high spire. The name *Ocenebra erinaceoides* Valenciennes is applicable to the southern form, a synonym of which is *Murex lugubris* Sowerby. The northern form, larger and with a higher spire, appears to merit the subspecific name *Ocenebra erinaceoides californica* Hinds. The latter is known to range from San Ignacio Lagoon, Lower California, to the Gulf of California.

After a short recess the Business Session of the meeting required the attention of all assembled. The minutes of the 1952 meeting were read and approved.

Moved, seconded, and carried, "that a committee of three be appointed to investigate the possibilities of holding a Post-Convention meeting in Honolulu." Chairman Allyn Smith appointed Howard Fletcher, of Redlands, chairman of said committee, with Merton Hinshaw of Pacific Grove, and R. Alexander of Los Angeles, to assist.

In the absence of Joshua Bailey, Chairman Smith appointed Dr. Wendell Gregg to serve on the Nominating Committee, who in turn placed before the group their selection of officers for the 1953-1954 term of office:

Chairman.....	Elsie M. Chace
Vice-Chairman.....	Ralph O. Fox
Secretary-Treasurer.....	Ruth E. Coats

There being no further nominations from the floor, the Chairman declared the above duly elected to office.

The following recommendation was made: "that we seek permission of the parent organization to elect to Honorary Membership in the A.M.U.P., for outstanding service to Malacology of the Pacific Coast, Dr. S. Stillman Berry and Andrew Sorensen." This action received unanimous approval.

President-elect Elsie M. Chace requested suggestions for the 1954 meeting.

The business meeting was adjourned.

The group next assembled in the dining room for the Annual Banquet. The arrangements and decorations by Myra Keen and her committee were attractive and greatly appreciated. After a delicious dinner the group returned to the classroom building for the final event of our program—to hear Dr. John S. Garth, of Allan Hancock Foundation, U. S. C., present "The New Frontier"—a colored film prepared by the Foundation, showing the various research activities of that organization and the many forms of marine life encountered in their work.

At this time, Dr. Berry was happy to show the group many beautiful necklaces and other forms of shell jewelry created by a young Japanese woman who had been sent to Tule Lake during the war period, and was now employed at Asilomar. She had written Dr. Berry for information on the shells she had encountered while at Tule Lake Camp, and was delighted to meet him in person at last, by chance here at Asilomar.

The program having concluded, the members retired to the Scripps living room, where they spent several hours telling of their collecting experiences and their plans for the future.

After a hasty breakfast on Sunday morning, we went our separate ways and the Sixth Annual Meeting of the Pacific Division was successfully concluded.

Respectfully,  
RALPH O. FOX,

1952-53 Secretary-Treasurer, A.M.U.P.

## **MEMBERS AND GUESTS ATTENDING THE SIXTH ANNUAL MEETING, A.M.U.P.**

Mr. and Mrs. Robert Alexander  
Mrs. Archerd  
Miss Betty Babbitt  
Mr. and Mrs. R. G. Beck  
Dr. S. Stillman Berry  
Mr. and Mrs. Ralph Bormann  
Mr. and Mrs. John Q. Burch  
Miss Helen Burton  
Mr. and Mrs. E. P. Chace  
Miss Ruth Coats  
Mr. William Emerson  
Mr. and Mrs. Walter Eyerdam  
Mr. and Mrs. Howard L. Fletcher  
Mr. Ralph O. Fox  
Dr. Wendell O. Gregg  
Dr. Leo G. Hertlein  
Mr. Merton E. Hinshaw  
Mr. and Mrs. George P. Kanakoff  
Dr. A. Myra Keen  
Mrs. Carrie E. Matzen  
Mr. and Mrs. Helmut Meier  
Mr. and Mrs. Louis Mousley  
Dr. Jens Ostergaard  
Mrs. M. Paulson  
Mr. Robert Robertson  
Mr. Andrew Sorensen  
Mr. and Mrs. V. D. P. Spicer  
Mr. and Mrs. John Strobeen  
Mr. Ray Summers  
Miss Harriet W. Thomson  
Mrs. Harry R. Turver  
Mr. Monroe L. Walton  
Mrs. Hazel Whelchel  
Mr. and Mrs. Ernest Wilcox  
Mr. Chester Wong  
Mrs. Lucille Zellers



We have lost another of our senior conchologists. Mr. Fred Randolph Aldrich passed away September 28th at the age of 87, although his host of friends who knew him and visited his Aldrich Museum of Newport Harbor, certainly never thought of him as an elderly man. No boy could have been more interested and enthusiastic about his avocation than was Mr. Aldrich. The Aldrich Museum is a beautiful place, one of the show spots of California for those interested in nature. We have not been advised about the future of the museum and the fine collection it contains; it is to be hoped that it will be permitted to continue. Since it actually faced Newport Bay, the collection of specimen mollusks from that section is probably unequalled anywhere. (From "Minutes of the Conchological Club of Southern California, October, 1953.")

*Photo by Ruppel*

### Delegates to Sixth Annual Meeting, American Malacological Union, Pacific Division

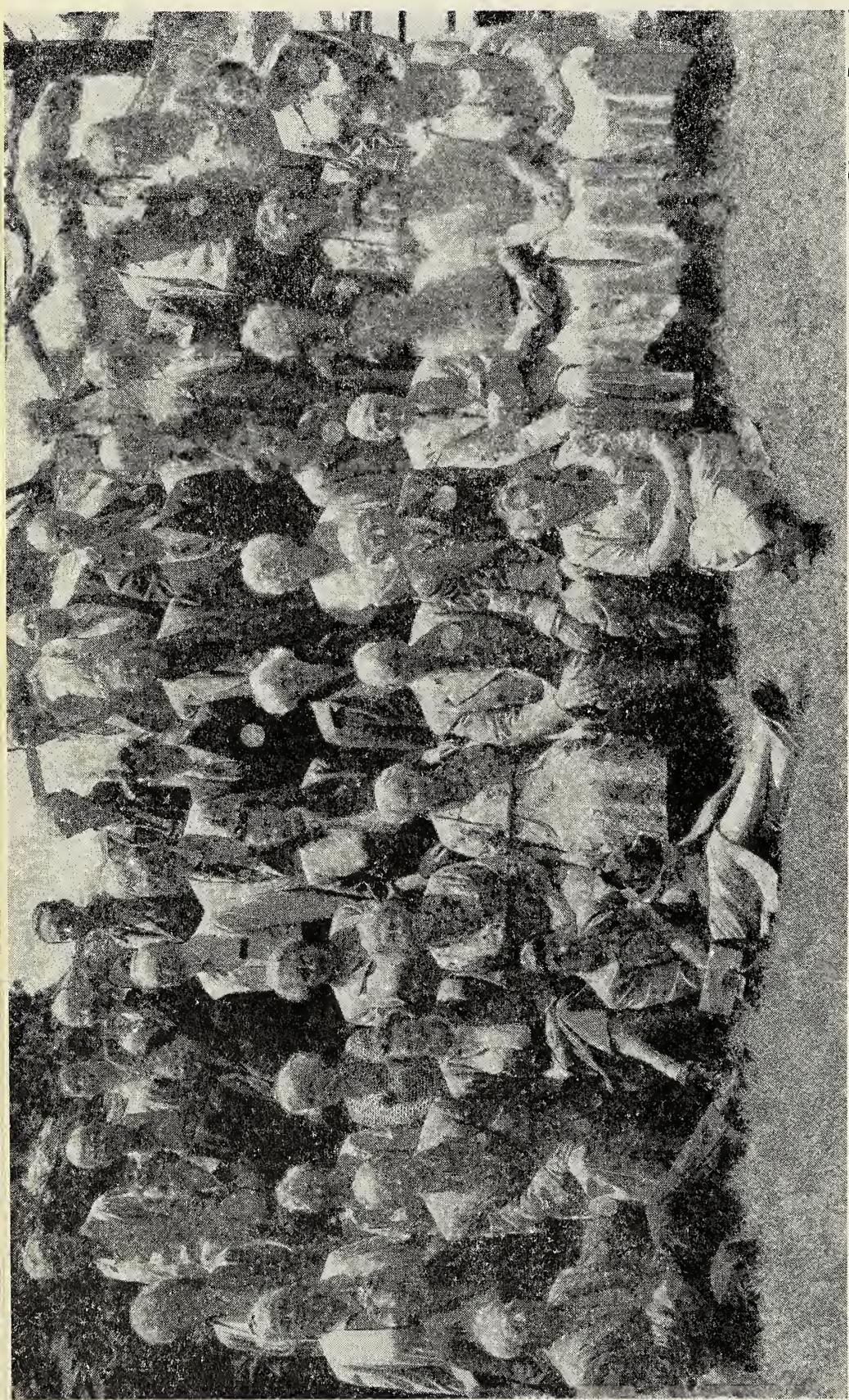
Front row (seated on ground): Emery Chace, Mrs. George Kanakoff, Mrs. Howard Fletcher.

Second row (seated): Mrs. Emery Chace, Allyn G. Smith, Mrs. Helmut Meier, Mrs. Grace Alexander, Mrs. Ernest Wilcox, Ernest Wilcox, Andrew Sorensen, Dr. Jens Ostergaard, Mrs. Betty Babbitt, Mrs. Lucille Zellers, Mrs. Louis Mousley.

Third row: Mrs. Ralph Bormann, Mrs. Paulson, Mrs. Walter Eyerdam, Mrs. Phil Spicer, Mrs. R. G. Beck, Mrs. Carrie Matzen, Miss Helen Burton, Mrs. Hazel Welchel, Mrs. Harry Turver, Mary E. Long, Dr. A. Myra Keen.

Fourth row: Harriet Thomson, Ruth Coats, Mrs. John Q. Burch, Walter Eyerdam, Robert Alexander, Robert Robertson, Dr. S. Stillman Berry, William Emerson, Dr. Wendell O. Gregg, Howard Fletcher, Monroe Walton, Phil Spicer.

Fifth row: Ray Summers, R. G. Beck, Merton Hinshaw, Ralph Fox, Helmut Meier, John Strohbeen, Louis Mousley, Dr. Leo Hertine, Ralph Bormann, John Q. Burch, George Kanakoff.



## NOTES, NEWS, ANNOUNCEMENTS

The twentieth annual meeting of the American Malacological Union will be held at the University of New Hampshire, Durham, N. H., August 16, 17, 18, 19, 1954. Sure to be a popular feature will be daily collecting trips, since the early morning tides are to be unusually low at that time. Detailed information will be sent to all members when plans have been completed.



The proposed new Constitution of the American Malacological Union appears on page 35 of this bulletin. This revisal was deemed necessary due to changes occurring over the past years, chief of which was the organization of the Pacific Coast Division. Members are urged to read it carefully, since they will be asked to vote for or against its adoption when dues for 1954 are remitted.



(From Dr. H. E. Wheeler, Indian Springs School, Rt. 1, Helena, Alabama)

"We are undertaking to build a museum from scratch, with the prospect of a building and equipment for educational work. I want to get in touch with collectors who may have ample duplicate material that they wish to spare for this very worthy project, first of all to illustrate the several orders and families of land, fresh water and marine shells. We already have a good supply of geological and mineralogical material but as yet no duplicate molluscan material for exchange. It will be some time before I can offer specimens that would appeal to the advanced collector."



The 1941 report bulletin of the American Malacological Union was in the form of a collecting symposium. The techniques of securing and preparing specimen mollusks was described by several different authors in this thirty-page pamphlet. The stories of reef collecting, dredging, land shell collecting, searching out fresh water mussels and other interesting topics made up a very handy reference booklet which has been out of print for several years.

A new edition of this publication is being prepared; to all of the material in the original will be added new features to report on methods of collecting not covered previously. "Recovering Minute Mollusks from Fishes Stomachs;" "Finding Snails in the Desert;" "Collecting Rock Borers;" these are but a few of the new titles.

Any A.M.U. member who has developed a new collecting angle or found a new way to tackle an old problem is urged to send in his experiences. If successful, "How to Collect," may be followed by "Where to Collect," so get behind this effort. Please send in your article before March 15, 1954. Address:

THE SECRETARY,  
American Malacological Union,  
144 Harlem Avenue,  
Buffalo 24, N. Y.

# THE AMERICAN MALACOLOGICAL UNION

CONSTITUTION ADOPTED 1931

1. This society shall be called "The American Malacological Union."
2. Its object shall be the promotion of the science of malacology by holding meetings for reading and discussion of papers, and for furthering the interests of students and collectors of shells by facilitating acquaintance and co-operation among the members.
3. Membership shall be limited to persons resident in the Americas and Hawaii. New members may be proposed by two members and balloted for by the Council. They shall pay an annual subscription (dues) of \$1.00. They will receive without other charge all notices, programs, lists of members, etc., issued by the Union.  
NOTE: In practice the Council ballots have been delegated to the Secretary.
4. The following officers shall be elected annually by ballot: President, Vice-President, two Secretaries and Treasurer.
5. The Union will be governed by a council consisting of the officers and four other members to be elected annually by ballot.
6. The annual meeting shall be held at such time and place as may be fixed by the preceding annual meeting. Other meetings may be called by the Council. Meetings of local branches may be held as such branches may determine.
7. Proposals for the alteration of this constitution when signed by five members and passed by the Council shall be acted upon at the next annual meeting. Concurrence of three-fourths of the ballots cast is necessary for any alteration.
8. The "NAUTILUS" is hereby designated as the official organ of the Union. (Zoological Laboratory, University of Pennsylvania, 38th and Woodland Ave., Philadelphia 4, Pa.)

## RESOLUTIONS

That there be an honorary membership for such as have contributed in an outstanding way to American conchology.— Adopted May 26, 1932. (The late Charles Torrey Simpson, Bryant Walker, Victor Sterki, and Thomas Barbour were honorary members).

That there be a corresponding membership for those not resident in the Americas.— Adopted May 26, 1932.

That the Council shall consist of the officers, honorary and past presidents, and members at large not to exceed four. Members of the Council present at any annual meeting shall constitute a quorum.— Adopted August 3, 1937.

That the Chairman of the Pacific Coast Branch be a Second Vice-President.— Adopted August 26, 1948.

That life membership may be purchased for the sum of twenty-five dollars.— Adopted August 20, 1952.

# CONSTITUTION OF THE AMERICAN MALACOLOGICAL UNION

(Proposed)

1. This Society shall be called "The American Malacological Union."
2. Its object shall be the promotion of the science of malacology by holding meetings for reading and discussion of papers, and for furthering the interests of students and collectors of shells by facilitating acquaintance and co-operation among the members.
3. Membership is open to persons resident in the Americas and Hawaii who are interested in mollusks. Those not resident in the Americas or Hawaii may become corresponding members. Membership is granted to those making written application to the Secretary-Treasurer. Annual dues are set forth in the by-laws. Life membership may be purchased for twenty-five dollars, with no further annual dues required. Honorary membership may be bestowed by a unanimous vote of the council upon those who have contributed in an outstanding way to malacology. These memberships may not exceed five living members.
4. The following officers shall be elected annually by ballot: President, Vice-President, Second Vice-President (Chairman, A.M.U.P., elected by the Pacific Division), Secretary-Treasurer, and four Councillors-at-Large.
5. The government of the Society shall be vested in the Council which shall consist of the officers, honorary and past presidents, and not more than four councillors-at-large. Members of the Council present at any annual meeting shall constitute a quorum. At other times the Council may consider matters pertaining to the Society and vote upon them by mail.
6. The annual meeting shall be held at such time and place as may be fixed by the Council at the preceding annual meeting. Meetings of the Pacific Division may be held as that branch may determine.
7. The officers of the Pacific Division, or any subsequently organized division, shall consist of a Chairman, Vice-Chairman and Secretary-Treasurer. The Executive Council shall consist of these officers and four additional members-at-large who have been past officers. The Division shall choose a representative to serve as a voting member at the annual Council meeting of the Union. The Secretary-Treasurer shall be empowered to accept and transmit A.M.U. dues and a list of members to the A.M.U. Secretary annually.
8. Proposals for the alteration of this constitution when signed by five members and submitted to the Council shall be acted upon at the next annual meeting. Concurrence of three-fourths of the members casting a ballot by mail, providing that notice of the proposed action has been sent to each voting member at least thirty days before the date of the vote, is necessary for any alteration.
9. The Society may enact by-laws that interpret this Constitution, and such by-laws may be adopted, amended or repealed by a two-thirds majority of those voting at an annual meeting of the Society.
10. The official publication of the Society shall be the Annual Report of the A.M.U. which shall contain accounts of meetings, notices, and a list of active and honorary members.

## BY-LAWS

1. The annual dues shall be one dollar.

## **MEMBER CLUBS**

### **CONNECTICUT SHELL CLUB, Gertrude W. Thompson, Secretary:**

The Connecticut Shell Club, which has 42 members, meets once each month at the Peabody Museum, New Haven. Our programs vary. Many of our members travel and thus are able to exhibit shells from far-away places which they have themselves collected or perhaps have purchased.

We are fortunate in that our president, Mr. Percy A. Morris, is employed at the museum and thus is able to present specimens and displays from the museum collection. Other officers are: Mrs. Frances Bissell, Vice-President; William Tuthill, Treasurer; Mrs. Gertrude W. Thompson, Secretary.

**HAWAIIAN MALACOLOGICAL SOCIETY, Doris L. Parker, Secretary:** The Hawaiian Malacological Society was founded in 1941. The Society has grown steadily and now has more than 75 active members. Meetings are held the first Wednesday of each month. Officers elected for 1952-53 were: President, Mr. Walter Bayer; Vice-President, Mr. H. M. Baker; Secretary, Miss Doris L. Parker; Treasurer, Mrs. Sara Getty.

One summer meeting is devoted to a "Shell Hunt" and the December meeting is Party Night, complete with shell-decorated tree and shell gift exchange. Other programs consist of talks, movies and discussions by members and their guests. During the past year such topics included:

"Anatomy of the Mollusca," by Mr. L. D. Strader and Miss Sara Ransom; "Scientific Studies of the Danish Expedition," by Mr. Hakon Mielche; "Bivalves," by Mr. Charles Allen; "Andrew-Garrett, Pioneer Naturalist of the Pacific," by Lt. Comm. Thomas; "South Pacific Shells," by Mr. Vernon E. Brock; "How to Clean Shells," by Dr. C. M. Burgess; "Conus," by Mr. Karl Greene; "Shell Construction," by Mr. Frank Palmer; "Cypraea," by Dr. Jens Ostergaard; "The African Snail," by Mr. Yoshio Kondo; "Atoll Mollusks," by Dr. Joseph P. E. Morrison.

The society is fortunate in receiving the advice and participation of such noted members as Mr. Spencer Tinker, Director of the Aquarium and author of "Pacific Sea Shells;" Dr. Jens Ostergaard, authority on Cypraea; Mr. Bryan, Mr. Wray Harris, Mr. Kondo and others of the Bernice P. Bishop Museum staff.

In June, 1952, under the leadership of Mr. Thomas Shields and Mr. Charles Allen, the Society acquired a booth at the 49th State Fair and presented an outstanding exhibit of shells. Members took turns attending the display and answering questions concerning the shells and the Society. It is anticipated that a similar booth will be arranged for the 1953 Fair.

Mr. Karl Greene writes weekly articles for a "Shell Column" in one of the leading island newspapers; he also sponsors a shell-collection club for children and a permanent exhibit at the Children's Museum located in the Ala Moana Park Pavilion.

Club projects and the work of individual members have contributed greatly to the increase in malacology among island residents. We from the islands extend a big welcoming Aloha! to fellow A.M.U. members from the mainland to look us up when you come to Hawaii.

## CONCHOLOGICAL CLUB OF SOUTHERN CALIFORNIA, Rose

**M. Burch, Secretary:** The Conchological Club of Southern California has a paid membership for 1953, of fifty-four adults (three more than in 1952, with three months yet to go).

Meetings are held in the evening at 7:30 o'clock the first Tuesday of each month, ground floor, S.E. entrance of the Los Angeles County Museum.

The following officers were elected for 1953:

President.....	Mrs. Harry Turver
Vice-President.....	Miss Ruth E. Coats
Secretary.....	Mrs. John Q. Burch
Treasurer.....	Miss Bessie Falconer

There is a publication, "Minutes of the Conchological Club of Southern California," edited by John Q. Burch. About ten issues a year are published.

In May, 1953, the Club became affiliated with the American Malacological Union.

There have been two field trips: one to Doheny Park (on the ocean), Orange County, and one at Point Fermin, San Pedro, Los Angeles County. Both were well attended.

September 9th, 1953, a special study class for a limited number of beginner-collectors was started, with Miss Ruth E. Coats as leader.

The California State Department of Fish and Game, Marine Fisheries Branch at Terminal Island, has generously furnished members attending the meetings copies of their Bulletin No. 90, "Common Marine Bivalves of California," and reprints of Calif. Fish & Game, Vol. 34, No. 40, "Abalones of California." From Mr. John E. Fitch, author of above bulletin No. 90, members have received fine specimens of *Hinnites multirugosus* taken from the breakwater at San Pedro, and he and Mr. Conrad Limbaugh have generously donated fine specimens of *Cypraea spadicea* Swainson, taken off La Jolla by diving 65 to 90 feet.

Besides the scheduled programs listed below, there have been reports on collecting and nomenclature; members are invited to bring their problems for round table discussion:

"Molluscan Notes from Punta Penasco Region, Mexico" by Dr. S. Stillman Berry.

"Trends in Malacology" (a recording) by Dr. William J. Clench.

"Stratigraphy of the Cretaceous Fossils of Puerto Santo Tomas de Baja, Calif., Mexico" by Mr. E. C. Allison of the Standard Oil Co. of California.

"Notes on Martyn's Universal Conchologists" by Mr. Emery P. Chace.

"Index of Molluscan Fossils" by Mr. George Kanakoff, Los Angeles County Museum.

"Hawaiian Collecting and Collectors" by Miss Ruth E. Coats.

"Labelling Specimens" by Mr. Gilbert Grau.

"Methods on Removing Mollusca from Their Shells" by Mr. Emery P. Chace.

"Activities in Relation to Mollusca of the Marine Fisheries Branch, State Department of Fish and Game" by Mr. John E. Fitch of the Department.

"The Genus *Calliostoma*" by Miss Ruth E. Coats.

"West Coast Olividae" by Mrs. John Q. Burch.

The programs were all well illustrated with specimens or pictures.

**CONCHOLOGICAL SECTION, BUFFALO SOCIETY OF NATURAL SCIENCES, Catherine Bradley, Secretary:** We meet on the third Friday of each month at the Buffalo Museum of Science, except during the summer when our schedule is enlivened by several picnics and more informal gatherings at the homes of members. A regular feature is the "Observation Poll" when each member is expected to contribute some item of interest that he has read or observed during the month. Papers read this year were: "Various Lake Erie Naiads," Eugene Musial; "Muricidae," Louise Becker; "Shells in Song and Story," Gertrude Weber; "Cypraeidae," Catherine Bradley. We were also treated to some excellent color films by Jean Russell.

The Section suffered a severe blow when our beloved friend, our patient teacher and long-time president, Imogene C. Robertson, passed away in February. Two meetings were cancelled because of her illness and when we again met it was with great sense of loss but firm determination to keep the Conchological Section alive and active as a tribute to her memory.

Our new president is the only charter member, Mrs. Annie Hoffman, who assisted in the organization of the club in 1897. Other officers are: Vice-President, Miss Gertrude Weber; Treasurer, Miss Louise Becker; Secretary, Mrs. Catherine Bradley.

The outstanding meeting of the year was held in one of the classrooms of the museum when the portion of Mrs. Robertson's shell collection that was given to the club was distributed to members. The collection had been willed to the Buffalo Museum of Science to be added to the collection there of which she had for many years been curator, "except for such duplicates as are not needed to enhance its value." And she had further directed that said duplicates were to be distributed among members of the Conchological Section. Such was the extent of the Robertson collection that laden trays of duplicates covered four long tables; choices were made in order of membership seniority, and everybody thus added many fine shells to our collections. We have further exchanged duplicates at subsequent meetings, and have been stimulated to label, arrange and catalog as never before.

**BOSTON MALACOLOGICAL CLUB, Margaret Farrell, Secretary:** Meetings of the Boston Malacological Club were held on the first Tuesday of each month (October through May) at the Massachusetts Society Library and were made up of the following programs:

Report on summer activities of members; "Malacology in New England," Miss Ruth Turner; "American Conchologists and Their Books," Mr. Richard I. Johnson; "Molluscan Fauna of the Puget Sound Region," Dr. Emery F. Swan; "Shipworms—Enemies of Man," Miss Ruth Turner; General Discussion, at which time members brought in interesting and unusual specimens connected with malacology; "Buoy Collecting off the North Carolina and Florida Coasts," Mr. Arthur Merrill; "Mollusks and Parasites," Dr. Wilbur Bullock.

The annual club outing was held at Wingaersheek Beach, Gloucester, Mass., where members did interesting collecting at extreme low tide.

The 1953-54 officers are: President, Mr. Herbert Athearn; Vice-President, Mr. Arthur Clarke, Jr.; Secretary-Treasurer, Miss Margaret Farrell; Conchological Recorder, Dr. Joseph C. Bequaert; Executive Committee, Mr. Arthur Merrill, Mr. Edward Michelson.

**NORTHERN CALIFORNIA MALACOZOONOLOGICAL CLUB, Lucille Zellers, President:** The Northern California Malacozoological Club has had a busy year. New officers were elected with Lucille Zellers as President; Margaret Oehlman, Vice-President; Phoebe Balch, Recording Secretary, and Mary Watson, Corresponding Secretary. Talks were given on collecting trips to various parts of Mexico by Ralph Fox, William K. Emerson, Helen Burton and Roger Blaine. Lucille Zellers gave a talk on "Collecting at Bodega Bay and Vicinity." A display of shells from each area was also shown. Betty Babbitt gave an interesting talk and demonstration on shell jewelry. Ray Summers, a member of the Hawaiian Shell Club, showed beautiful colored slides of his shell collection; he also brought some of his rare *Cypraea* to show the group. Merton Hinshaw, Curator of the Pacific Grove Museum, acted as narrator of a beautiful color-film of living marine life in the Great Tide Pool at Pacific Grove. Jens M. Ostergaard, retired Instructor of the University of Hawaii, showed color slides of *Cypraea* and volutes and talked briefly about localities where species were found. Colonel Lee O. Miles gave a very interesting, informative and well-illustrated talk on *Haliotis*. A Junior Shell Club was organized by Marianna Paulson. Several members went on collecting trips. Members with sizable collections invited the club to their homes to view their collections. Through the courtesy of the University of California Zoology Department we were able to obtain a collection of Chitons imbedded in plastic (the work of Dr. Rudolf Stohler, a member of our club) to exhibit in the Marine Room of the Oakland Museum. An exhibit was also placed in the Oakland Public Library by Mary Watson, Diana Watson (Junior Shell Club), and Helen Burton. West Coast material is being prepared for the use of the club as well as to exhibit in the Museum. Members are donating shells and a meeting recently featured a work session where everyone entered into the spirit of the occasion by making boxes, printing labels, etc.. Part of the Hemphill collection was brought to one of our meetings and it was especially interesting to note the manner in which the shells were mounted. A film, "Seashore Oddities," will be presented at the next meeting. Our membership is growing and no attendance during the summer sessions was less than 19. In June eight of our members attended the A.M.U.P. Convention at Asilomar. We are indeed proud that both Allyn G. Smith, Chairman, and Ralph Fox, Secretary of 1952-53 A.M.U.—Pacific Division, are members of our club.

**THE NEW YORK SHELL CLUB, Morris K. Jacobson:** The New York Shell Club, now going into its fifth year of existence and with its membership at an all-time high, is attracting good numbers regularly to its monthly meetings, the attendance of members and guests varying between 35 and 50 at each session. The usual lively interest is displayed in the superior papers that are read. Among the most valuable were: Eddy Slater on "The Shells of Great Neck, L. I."; Michael Krassner on the "Variations of *Littorina littorea* in the New York City area"; Jack McLellan on his discovery of the rare *Polygyra sayoides* in West Virginia; Miss Katherine Ahders on "The Shells of Fire Island"; and several beautifully illustrated talks by Messrs. Jacobson and D'Attilio on the backgrounds of taxonomy of shells. Some more faunal records were chalked up: the discovery of other colonies of *Discus rotundatus*, one in Rockaway by Messrs. Jacobson and Carswell and another in New Jersey—the first for the state—by Sam Freed. D'Attilio, Carswell, Jacobson and Athearn also verified the presence of *Congeria leucophaeata* in the Hudson, several hun-

dred miles north of its hitherto reported range. At each meeting a sort of tradition has developed for at least one member—frequently more—to bring a box of duplicates to the Club for distribution. The eagerness of members to outdo one another in generosity lends an unusual spirit of fellowship and mutual respect to our gatherings.

This year we were honored by the presence of various important and highly welcome guests, among them being Mr. Herbert Athearn of Boston, Mr. and Mrs. Sennott, who were on their way to settle in Florida, and who most generously left each of us a splendid specimen of the unusually beautiful *Melongena corona* from Punta Rassa, Florida; and Dr. Jeanne Schwengel who regaled us with a warm description of her incomparable collection. Our most welcome guest was Dr. William J. Clench who made us feel most obligated and humble by leaving his myriad tasks in Cambridge to come down to us to deliver a color slide lecture on Cuba and its land shells. We were happy to note that this meeting was by far our best attended one, no less than 87 members and friends being present. It was fitting that the season's activities ended on this climatic note. Our new officers are: President, Dr. Walter H. Jacobs; Vice-President and Treasurer, Mr. Anthony D'Attilio; Recording Secretary, Mr. Edward F. Cowles, Jr.; Corresponding Secretary, Mrs. Dorothy D. Freas.



Those persons wishing to purchase earlier editions of the A.M.U. annual report bulletins may do so by ordering from the secretary; such copies as are at hand will be supplied and the purchaser billed at the following rates: dates prior to 1940, \$1.50 each; 1940 to 1952, \$1.00 each. The earliest editions (from 1932) are in short supply, and in no case can a full set be assembled. The report for 1941 was in the form of a "Collecting Symposium" and no copies remain. No bulletin was published in 1942, and 1944-45 was covered in one report. The secretary will be pleased to obtain copies of the report bulletin for the years 1932, 1933, 1934, and 1941, and will pay \$1.50 each for all received.

Also available:

**BIBLIOGRAPHY AND SHORT BIOGRAPHICAL SKETCH OF  
WILLIAM HEALEY DALL**

(Publication No. 3810 of Smithsonian Institution)—50 cents

**SCIENTIFIC CONTRIBUTIONS MADE FROM 1882 TO 1939  
BY HENRY A. PILSBRY, Sc.D.**

(Publication of American Malacological Union)—\$1.00

**THE AMERICAN MALACOLOGICAL UNION  
EXECUTIVE COUNCIL  
1953-1954**



**Officers**

President.....	DR. JOSEPH C. BEQUAERT
Vice-President.....	MORRIS K. JACOBSON
Second Vice-President.....	(Chairman, A.M.U.P.) MRS. ELSIE M. CHACE
Treasurer-Secretary.....	MRS. MARGARET C. TESKEY



**Councillors-at-Large**

R. TUCKER ABBOTT	DR. MIGUEL L. JAUME
RALPH W. JACKSON	DR. ALBERT R. MEAD



Past Presidents remaining on the Council without reelection: Dr. Henry A. Pilsbry (1931-1932); Dr. Paul Bartsch (1933); Prof. Junius Henderson (1934)\*; Dr. William J. Clench (1935); Calvin Goodrich (1936); Dr. Joshua L. Baily, Jr. (1937); Dr. Carlos de la Torre (1938)\*; Maxwell Smith (1939); Dr. Horace B. Baker (1940); Dr. Harald A. Rehder (1941); Frank Collins Baker (1942)\*; Dr. Louise M. Perry (1943); Dr. Henry van der Schalie (1944-1947); Dr. A. Myra Keen (1948); Dr. Elmer G. Berry (1949); Dr. Fritz Haas (1950); Dr. J. P. E. Morrison (1951); Dr. Jeanne S. Schwengel (1952); Dr. A. Byron Leonard (1953).

Honorary Presidents: Mrs. Ida S. Oldroyd (1934-1940)\*; Dr. Henry A. Pilsbry (1936-); Mrs. Imogene C. Robertson (1939-1953)\*.

\*Deceased.



**PACIFIC DIVISION**

**Officers**

Chairman.....	MRS. ELSIE M. CHACE
Vice-Chairman.....	RALPH O. FOX
Secretary-Treasurer.....	MISS RUTH E. COATS

## ACTIVE MEMBERS

[Membership List Revised December 31, 1953]

- Abbott, R. Tucker, U. S. National Museum, Washington 25, D. C.  
Aguayo, Dr. Carlos Guillermo, 4 No. 554 Vedado, Habana, Cuba.  
Ahern, Mrs. Thomas, 8082 Cheyenne Ave., Detroit 28, Mich.  
Albert, Mrs. Ernest, Post Eng. Rycom., APO 331, c/o PM, San Francisco.  
Alexander, Robert C., 423 Warwick Rd., Wynnewood, Pa.  
Allbee, Joel R. M., 1112 Neola St., Los Angeles 42, Cal. Invert. paleontology.  
Allen, Dr. J. Frances, Dept. of Zool., Univ. of Maryland, College Park, Md.  
Ancona, Prof. Ignacio, Instituto de Biologica Casa del Lago de Chapultepec, Mexico D. F.  
Anderson, Col. A. S., 504 Carroll St., Dothan, Ala. Worldwide shells.  
Anderson, Miss Katherine M., Box 206, Chillicothe, Ohio. Pecten, Murex.  
Andrews, Mrs. James N., Somerset, Va.  
Ashbery, Mrs. Wallace H., 12 E. Depew Ave., Buffalo 14, N. Y.  
Athearn, Mr. and Mrs. Herbert D., 48 Crane Ave., Taunton, Mass. Fresh water mollusks.  
Athearn, Mrs. Roy C., 5105 No. Main St., Fall River, Mass. Land shells.  
Atwater, Rev. David T., 50 Grace Court, Brooklyn 2, N. Y.  
Awald, Clifford J., 162 Southwood Dr., Kenmore, N. Y.  
Ayers, Donald F., West Bloomfield, N. Y.  
  
Babbitt, Mrs. Betty, 7364 Terrace Dr., El Cerrito, Cal. General marine life.  
Bailey, Prof. John Wendell, 606 Ridgecrest Dr., Albuquerque, N. Mexico.  
Baily, Dr. and Mrs. Joshua L., Jr., 4435 Ampudia St., San Diego 3, Cal.  
Baker, Dr. Frederick C., Box 51, Mansfield Depot, Conn.  
Baker, Dr. and Mrs. Horace B., Zoological Lab., Univ. of Penn., 38th St. and Woodland Ave., Philadelphia, Pa. Res. 11 Chelten Rd., Havertown, Pa.  
Balch, Prof. Francis N., 130 Prince St., Jamaica Plain, Mass.  
Bales, Mrs. Blenn R., 149 West Main St., Circleville, O.  
Bartlett, Mrs. R. D., 200 Cedar Croft Rd., Baltimore 12, Md. E. coast shells Md. to Fla.  
Bartsch, Dr. Paul, Smithsonian Institution, U. S. National Museum, Washington 25, D.C. Residence, "Lebanon," Gunston Hall Rd., Lorton, Va.  
Bates, Miss Esther S., 161 So. Atlantic Ave., Daytona Beach, Fla. Exchange.  
Bayer, Frederick M., Div. of Marine Invert., U. S. Nat'l Museum, Washington 25, D. C.  
Beatty, George D., R. 1, Sandusky, O. Land and f.w. mollusks of Great Lakes region.  
Beck, Mrs. R. G., 422 So. Vine St., Escondido, Cal.  
Becker, Miss Louise W., 2 Lexington Ave., Buffalo 22, N. Y.  
Bengston, Mrs. George, 816 Colleen Ave., Waterloo, Iowa. Land, f.w., fossils.  
Bequaert, Dr. Joseph C., Museum of Comparative Zoology, Cambridge 38, Mass.  
Berry, Dr. and Mrs. Elmer G., National Institutes of Health, Bethesda 14, Md.  
Berry, Dr. S. Stillman, 1145 W. Highland Ave., Redlands, Cal.  
Billard, Ruth S., Rowayton, Conn.  
Bippus, Alvin C., Jr., 1918 Bayard Pl., Toledo 6, O. Col. Marine univalves.  
Blaine, Alger P., 74 Palmer Ave., Springfield, Mass.  
Bloom, Robert J., 104 Eloise Terrace, Syracuse 7, N. Y.  
Boeheim, Mrs. C. H., 305 West Main St., Palmyra, N. Y.  
Bormann, Mrs. Mary, 4331 Vermont St., Long Beach 14, Cal.  
Boston Malacological Club; Sec. Miss Margaret F. Farrell, 148 Walnut St., Brookline, Mass.  
Bourgeois, Miss Marie E., 3a Tiziano 35, Mixcoac D. F., Mexico.

Bradley, J. Chester, 604 Highland Rd., Ithaca, N. Y.

Braun, Garwood A., Wittenberg College, Springfield, Ohio. Unionidae.

Brewster, Miss Helen, 333 5th St., So., St. Petersburg 5, Fla., and E. Troy, Wisc.

Brill, Mr. and Mrs. J. A., 2301 Gulford Lane, Oklahoma City 14, Okla.

Bristol, Miss Viola S., 1253 12th Ave., San Diego 2, Cal.

Bronner, Dr. and Mrs. Carl E. Cahn, 5417 S. Blackstone Ave., Chicago 15, Ill.

Bronson, Albert B., P.O. Box 667, Agana, Guam, M. I.

Brown, J. J., Rehabilitation Director, State Board of Vocational Education, P. O. Drawer BB, Capitol Sta., Austin 11, Tex.

Brown, Mrs. Ward, 1420 N. Lakeside Dr., Lake Worth, Florida.

Brunson, Royal Bruce, Montana State Univ., Missoula, Mont.

Burch, Mr. and Mrs. John Q., 1584 W. Vernon Ave., Los Angeles 62, Cal.

Burch, Dr. Paul R., 614 W. Fourth St., Radford, Va.

Burke, Mrs. Clara T., 2126 S. Simpson St., Philadelphia 42, Pa. School collections.

Burkhardt, Lorilee, 62 Lexington Ave., Holyoke, Mass.

Burrow, Mrs. F. H., 1401 Plass Ave., Topeka, Kansas.

Burry, Mrs. Leo A., Burry's Marine Museum, Rt. 1, Box 544, Pompano Beach, Fla.

Burton, Helen A., 391 Adams St., Oakland 10, Cal.

Carswell, Edwin J., 4309 40th St., Sunnyside, Long Island 4, N. Y. New York land shells, world marines.

Casey, Mrs. Robt. V., 2136 Briargate, Kirkwood 22, Mo. Florida west coast shells.

Castellanos, Dr. Jose R., Virtudes 258, Dep. 110, Habana, Cuba. Marine mollusks.

Chace, Mr. and Mrs. E. P., 24205 Eshelman Ave., Lomita, Cal.

Chamberlain, J. Lockwood, Biological Lab., Harvard University, Cambridge 38, Mass.

Champion, Dr. Merrill E., 9 Salem St., Wakefield, Mass.

Chandler, Mrs. Doris M., P.O. Box 621, Chatham, Mass.

Cheever, Dr. Austin W., 464 Beacon St., Boston 15, Mass.

Chen, Sui-fong, 4529 Middleton Lane, Bethesda, Maryland.

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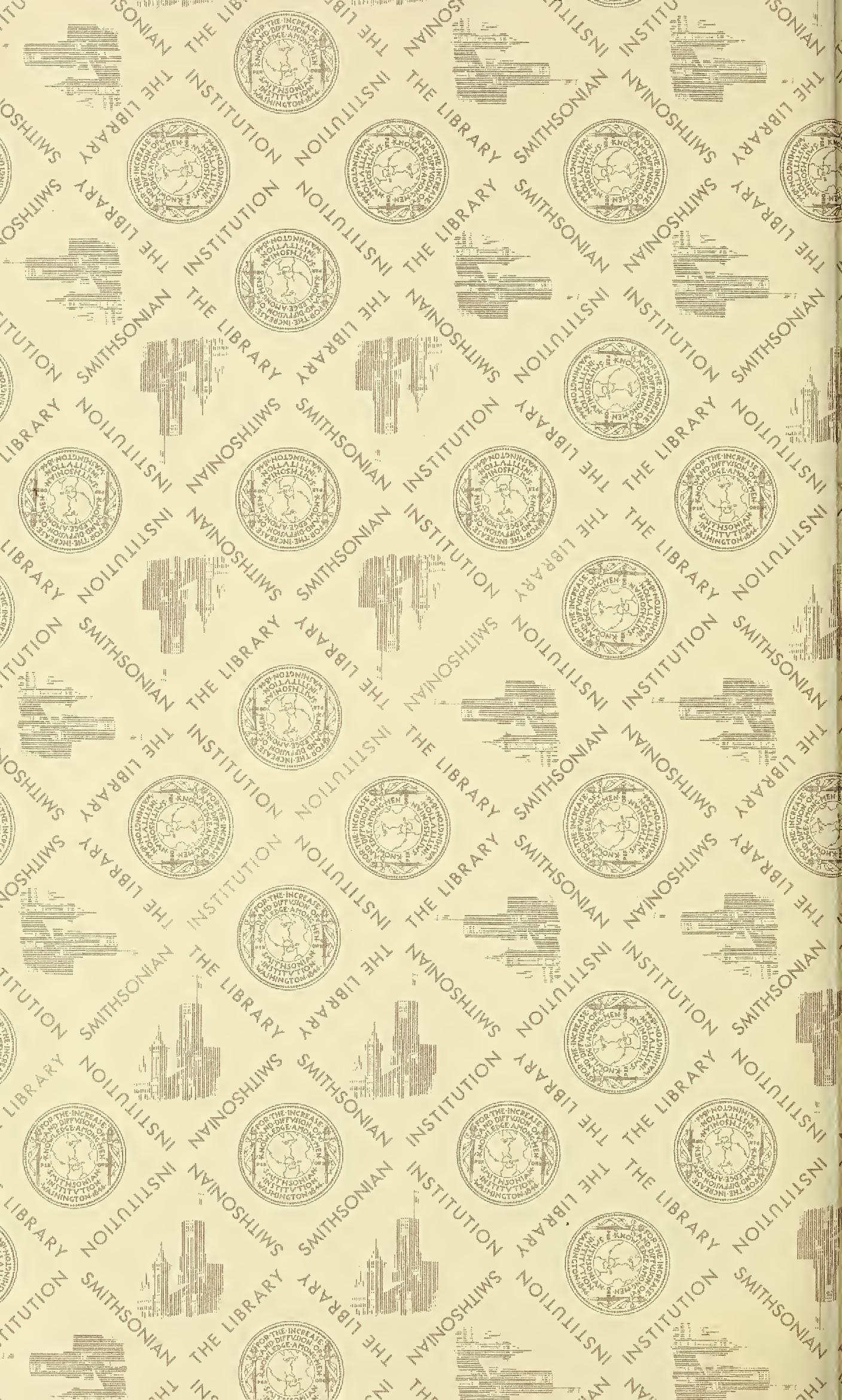
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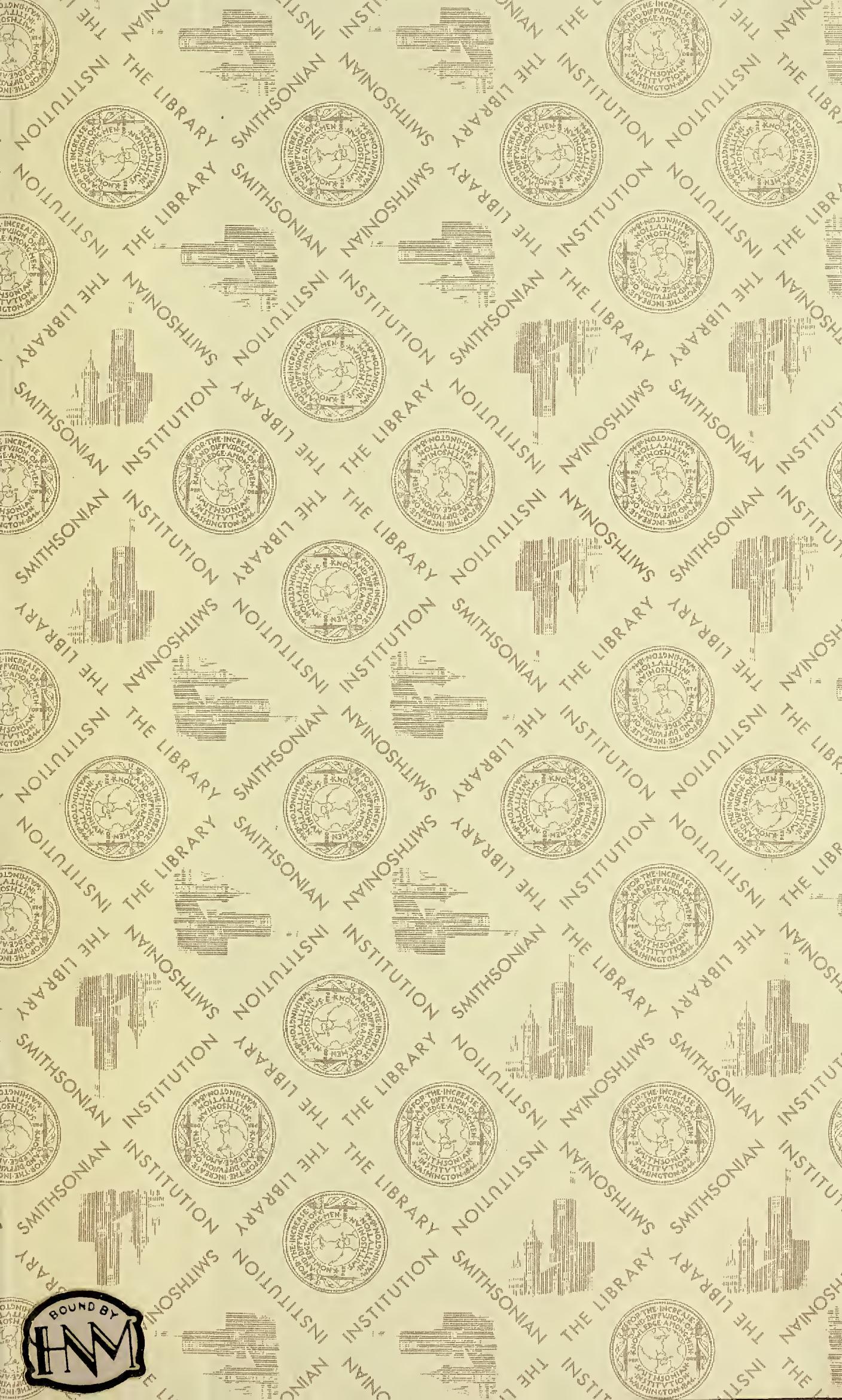












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